An archaeological assessment of the prehistoric and protohistoric evidence from the island of Korčula, Croatia

In Two Volumes

Volume I

Text

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Declaration of Research Undertaken

This is to certify that the author has composed this thesis research and that the contents are attributed solely to him, unless otherwise cited.

Bryon Louis Bass

Edinburgh, 1997

Ph. D. Thesis Abstract: Bryon Bass
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This thesis explores various aspects of the archaeological evidence found on the island of Korčula, Croatia, and its nearby islets. The specific geographic nature of the island allows a defined and critical analysis of past occupations. While the past cultural occupations on Korčula generally fall within recognized regional archaeological sequences, the specific nature of the island's archaeological record seems to be unique in many instances. The investigations conducted for this thesis give further insight into the nature of settlement patterns and resource exploitations along the Dalmatian Coast. Furthermore, Korčula should prove to be an ideal case study for regional socio-cultural and economic organization.

The research focuses on the prehistoric and protohistoric periods. The prehistoric period ranges from the Mesolithic through to the Iron Age. The protohistoric period is generally assigned to the Iron Age Illyrian occupations, which are primarily associated with Late Archaic Greek evidence.

The data for the thesis has been gathered and examined through numerous methods. A bibliographic review establishes the background to the island as well as the Dalmatian Coast region. The primary archaeological field sampling techniques applied include systematic landscape survey, test excavations, and artifact surface collections. A comprehensive computer database was designed along with a museum documentation system and a bilingual sites and monuments registry. Numerous specialized examinations, such as pedological analysis and profiles, x-ray fluorescence and x-ray diffraction of clay source materials and pottery, have also been conducted to gain further insight into the nature of the archaeological record. The emphasis in these case studies centers on their research potential for future applications.

Foreword

The thesis is contained in two volumes. Volume I contains the main text and all bibliographic references cited. Volume II contains the appendices, which are comprised of figures, tables, graphs, plates (Appendices a), and specially prepared reports derived from the computerized database (Appendices b). The appendices in Volume II do not contain page numbers, as the figures and plates are arranged in an increasing numeric order (e.g. fig. 1, fig. 2, fig. 3, etc.), and the database contains an alpha-numeric increasing order (e.g. KB-001, KB-002, KB-003...KC-001, KC-002, etc.).

The system that has been used for referencing is based on the style guidelines published in American Anthropologist, 1976, 17 (4): 9-11. The guidelines employ a consistent format that takes into account all types of literary sources. Footnotes have been used to indicate information which is pertinent yet supplemental to the text discussions. The spelling and grammar used throughout this thesis is based on the American English variant, unless the text is contained in a cited quote. To facilitate the letters of the Croatian alphabet, a font called "Centrepiece_PP", which is similar to "Times New Roman", was used throughout the thesis and the database. The author has prepared all illustrations and plates, unless cited otherwise. Finally, all deficiencies with the research and content of this thesis remain solely attributable to the author.

Acknowledgments

The author would like to acknowledge numerous people who have been supportive during this thesis research. My family has given me persistent encouragement throughout my research. In the end, without their support, this research would not have been possible. At the University of Edinburgh, my supervisors Professor Dennis. W. Harding and Dr. Magdalena Midgley have not only been instrumental in their guidance of certain archaeological aspects of this thesis, but have also given the author complete academic freedom to discover all the pitfalls and dead-ends related to research of this nature. In the Department of Archaeology, University of Edinburgh, Dr. Robert J.S. Sands has put up with the author's relentless haranguing regarding everything from the mundane (e.g. countless computer related problems) to the crucial (how to process and print black and white film in a sanitary manner). Ms. Zoë Astrella Watt has been my faithful companion, not only giving valuable support regarding geological aspects of the research, but also as the primary proof reader of the text.

Also in the Department of Archaeology, Mrs. Fiona Stephen has prepared and processed clay and pottery samples for x-ray diffraction and x-ray fluorescence. Mr. Adam Jackson, in the Department of Archaeology, also willingly volunteered to proof read parts of the text. In the Department of Geography, University of Edinburgh, Mr. Chris Minty, in the Physical Geography Laboratory, has not only given his time to the author's many questions regarding the nature of sediments, but also has processed the author's research samples and pointed out the implications of the results.

At the University of Birmingham, Field Archaeology Unit, Dr. Vince Gaffney has been helpful, not only with numerous hard-to-find references concerning the Dalmatian Coast, but also by indicating to the author a certain "academic protocol" vital to archaeological research in the region. At the University of Ljubljana, Department of Archaeology, Predrag Novaković (a.k.a. the Ambassador of Archaeology) has been a trustworthy friend and colleague over many years. When all things are said and done, Predrag should be recognized the author's original connection to the archaeology and archaeologists of the region. Likewise, the rest of the staff at the Department of Archaeology, University of Ljubljana, have been most helpful to the author over many years.

At the *Universität Zürich, Abteilung Ur- and Frühgeschichte,* Dr. Philippe Della Casa has given the author much insight into research on the Dalmatian Coast. He has allowed the author to review materials from his own research at Velika Gruda, given the author access to the archaeology library at the University of Zürich, allowed the author to assist with archaeological research in the Swiss Alps, and has been a reliable friend and colleague. Dr. Biljana Schmid-Sikimić, also in the *Abteilung Ur- and Frühgeschichte,* Zürich, has been most courteous to the author on numerous fronts, both professional and personal. At the Vindonissa-Museum, Kanton Aargau, Switzerland, Guido Lassau has given the author much friendship and assistance in both professional and casual capacities.

In Croatia, there are countless individuals who deserve recognition. Primary among these is Branko Kirigin, at the Arheološki muzej, Split, who has been helpful to the author over many years and has been most instrumental to the author's research on Korčula. Asja Zec (Zagreb/ Pag), Ana Lebel-Nikšić and her husband Goran (Split), and Irena Radić (Zagreb) have also helped with many professional and archaeological aspects of the research.

On Korčula, Aldo Mirošević has been completely devoted, not only to the archaeology, but also to other causes such as friendship and photography, to name but a few. The staff at the *Centar za kulturu* and at the *Opčina* in Vela Luka have given freely of their time to many of the author's research needs and odd requests. Likewise,

Ante, Ivana, Katherine, and "Mama" Mirošević deserve mention for adopting the author as an extended family member. Franco, Maria, and Boris Žuvela-Pikin and Nensi, Zdenko, Ivana, and Hrvoje Miletić (Vela Luka/ Vranac) have extended their hospitality on countless occasions. The Joković family has also provided the author with a very comfortable flat throughout most of this research. Essentially, the author would like to thank all the people from the village of Vela Luka for their invaluable support over the years.

Numerous people from Korčula town, primarily Neven Fazinić, have helped the author on numerous occasions. Over the years, many people from the numerous villages across the island of Korčula have assisted the author in any and all capacities. Their names will go without mention here, for they would number in the hundreds.

The late Sir Fitzroy Maclean, of Dunconnel Bt. KT CBE, shared some of his last moments with the author at Strachur House, Argyll. His insights into the peoples and history of Korčula, Dalmatia, the Balkans, and for that matter, the entire planet, were without parallel. His interest and support of the author's work over the years has been greatly appreciated. Likewise, the author would like to thank his surviving family and wife, Lady Veronica, and naturally, Sheila Macpherson (Mrs. M), for sincere Scottish Highland hospitality in Strachur.

The author would also like to recognize the Abercromby Travel Fund, administered by the Abercromby Professor of Archaeology, Professor Dennis W. Harding (Edinburgh), the Amado Academic Scholarship (Los Angeles), and the Maccabie Student Scholarship (Los Angeles), for their financial assistance over the years of research.

Finally, the author would like to thank Professor Dinko Radić, friend and colleague, for his key support in the author's research. Professor Radić has allowed the author to have office space, storage space, darkroom facilities, and complete access to the *Arheološki muzej,* Vela Luka, throughout the years of research. Furthermore, he has given the author numerous literary references to Korčula which would have been impossible to find elsewhere. Likewise, he has introduced the author to some of the worst Dalmatian terrain, in search of the best archaeological record. During the first season of research, Professor Radić set the author off onto completely unsurveyed archaeological landscapes with the following words of advice: "If you don't go, you'll never know."

Edinburgh, Scotland
10 March 1997

"...I write what I believe to be the truth, for the Greeks have many stories which, it seems to me, are absurd..." [1]

Hecataeus

"...I do not deny that off and on a story may have some truth in it, but what I would like to stress is that information gathered from a Greek story ought to be taken into consideration only in so far as it agrees with what has been revealed by archaeological discoveries..." [2]

Grga Novak

"...We did not come to any particular conclusion about the tumuli..." [3]

Sir Fitzroy Maclean

"...Archeology is the only branch of anthropology where we kill our informants in the process of studying them...And because we kill our informants as we question them, we have to question them in ways that are less idiosyncratic and more universally accepted..." [4]

Kent V. Flannery

"...Not all the questions will receive an answer..." [5]

François Bordes

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[1] *Historia*: fr. 1.
[2] Novak, G. 1955. Prethistorijski Hvar: Grapčeva spilja. Zagreb, 299.
[3] Maclean, F. 1950. Eastern Approaches. London, 154.
[4] Flannery, K. 1982. The Golden Marshalltown: A Parable for the Archeology of the 1980s, *American Anthropologist* 84, 1982,: 265-278.
[5] Bordes, F. 1972. A Tale of Two Caves. New York: Harper & Row, 1.

GLOSSARY OF SPECIFIC CROATIAN WORDS and SPECIAL TERMS USED IN THE TEXT

blato
Literally mud; this term often applies to marsh-type areas as well, and can also be found as a toponym in areas that no longer have mud or marsh conditions.

dolina
A valley, dale, or on the karst, a sinkhole

fiaka
The mid-day nap taken during the summer months on the Dalmatian islands.

gomila
Literally, a pile or heap, and more often that not, of dry-stone (limestone) materials; regarding this toponym, the term usually refers to a pile of limestones, in any landscape location, and in any size/ shape condition; often, these are tumuli, but many have been found to be vacant, possibly stone field clearances or unused prehistoric cairns. The generic term *gomila* has been also been applied to prehistoric dry-stone structures found on the landscape that have been archaeologically assessed as towers, hillforts, ritual structures, and prehistoric structures of unknown function.

glavica
A knoll, mound; literally ***glava*** translates as "head".

gradina
A hillside or hilltop settlement, often fortified, although this latter feature is usually the exception, not the rule, on Korčula. All of the positions on Korčula's landscape with this toponym have Bronze or Iron Age occupational remains of some kind. A similar toponym is sometimes found as *Gradac.* In the case of Korčula, all are on hilltops, although regionally, they have also been detected on hillsides.

kula
A tower. Korčula has one toponym with this name, and an associated prehistoric hilltop structure is situated on this position. The name "kula" has also been given to certain prehistoric structures on the island that appear, in shape at least, to resemble a type of viewpoint or watchtower. (plural: kule).

lokva
A pond, puddle, or pool. On most maps, the term is usually associated with geographical areas where water collects. Often, these occur in dolines on the karst landscape. (plural: lokve).

makija
An evergreen shrub which is common throughout the Mediterranean; often found in the literature as *macchia* or *maquis*; often associated with anthropogenically modified landscapes. The "shrub" can be found to be a mixed vegetation cover consisting of *Juniperus, Phillyrea,* and other local evergreen plants, shrubs or trees.

mala/i
Translates generally as "small, little, or minor". The abbreviations, often found as "M." or "m." on topographic maps, are used to designate a smaller geographic area or geologic feature from a larger locality with the same toponym. e.g. Mala kapja (or M. kapja) *versus* Velika kapja (see fig. 3).

masl
The acronym for "**m**eters **a**bove **s**ea **l**evel".

nm.
Abbreviation for **n**autical **m**iles.

polje
A field or plain; often seen as flat areas situated in karst valleys or recesses.

***špilja* or spilja**
A cave. Also seen on topographic maps labeled as ***pećina*** or ***peć***, which can mean a "cave cliff, or rock".

uvala
A bay; gulf; or cove, and often abbreviated on topographic maps and hydrographic charts as "U." or "u.". e.g. U. Gradača (see fig. 3).

velik-a/i
Translates generally as "big; large; or great". Abbreviations are often found on topographic maps and hydrographic charts as "V." or "v.".

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Chapter One

General Overview of this Thesis Research

1.0 Introduction to the Thesis

The field research for this thesis, conducted on the island of Korčula off Croatia's Dalmatian Coast (see fig. 1), was performed over the summer seasons from 1993 through 1996. It should be clarified from the outset that systematic archaeological field survey and research into the prehistory and protohistory of the island, except for the few instances detailed in the text, were not conducted on Korčula prior to this thesis research.

1.1 General Background to the Research on Korčula

Much of the prior archaeological research on Korčula was conducted through historical methods in which numerous authors merely referenced unsurveyed localities and unexamined archaeological sites. More often than not, the references that concern Korčula and the adjacent Pelješac Channel islets (fig. 2) are comprised of brief details of surface finds and finds recovered from unsystematic "soundings". Minor Roman and Greek archaeological studies have been most predominant, as a percentage, throughout the references concerning Korčula. Most concern descriptions of small finds or the ruins of Roman *villae rusticae*. Except for the numerous but brief articles detailing the prehistoric occupations in Korčula's rich cave site known as Vela spilja (see relevant sections, Chapter 5), no more than a few published pages are at all relevant to current prehistoric and protohistoric studies.

The regional trends (southeast Europe in general, former Yugoslavia specifically) have traditionally been concerned more with artifact typologies and chronologies. This approach has been seen as the most important aspect of archaeological research, and it has even recently been noted that careers and reputations of archaeologists in the region can stand or fall merely on questions of chronology and typology (Kaiser 1995: 108-109). It should be noted that many of the early researchers on Korčula were quite ahead of their regional archaeological peers in many aspects of the fieldwork, including area specific studies (cf. Radić and Vuletić-Vukasović 1887; 1890) and selective site investigations with assessments of the associated archaeological materials (cf. Novak 1954).

It is clear that the earlier archaeologists worked not only within their practical means but also mainly within the known archaeological information pertaining to the

island's prehistory. Brief articles restated known finds, and it is not clear if many of the sites were even revisited. For example, prior to this thesis research, no more than 6 hilltops on the island were documented with evidence of prehistoric remains (Gjivoje 1969: 38-42). This static body of evidence was known before Gjivoje's work, but remained unexamined until the time of this thesis research. Numerous sites found on this survey were quite obvious and "high profile" on the landscape but not easily accessed through the foreboding makija. It is assumed that this vegetation must have discouraged land survey in the past. Finally, due to the absence of any survey activity being described in the literature, it is clear that archaeological field survey and terrain reconnaissance was not conducted on Korčula prior to 1993.

1.1.2 The Research Group Formed for Current and Future Work on Korčula

Croatia became an independent country from the former Yugoslavia in 1991, so naturally current work on the island requires approval from the proper Croatian authorities. A complete examination of the documentation required for research in Croatia need not be detailed here. However, it should suffice to mention that all proper authorities and associated offices from Zagreb down to the southern end of the Dalmatian Coast are aware of this research on Korčula.

The author determined that the best route to take for the thesis research and future studies on the island would be to form a multi-national archaeological research group with a base on the island. The island has a "resident" archaeologist (Prof. Dinko Radić) who directs the *Centar za kulturu* (cultural center) for the village of Vela Luka (see figure 3), and maintains the *arheološki muzej* inside the *Centar*. Most, if not all, archaeological queries regarding the island have been directed to him since the late 1980s. Prof. Radić was consulted regarding the required steps needed to conduct an ongoing survey (with collection and possible sub-surface testing) and the multinational framework approach was suggested. Prof. Radić agreed that this would be the best approach specifically for future collaborative efforts. The idea of incorporating researchers from outside Croatia (besides the author) seemed the best avenue for future funding and research resources. Finally, the research group formed from these initial discussions between Prof. Radić and the author has been recognized as the Korčula Archaeology Research Group (KARG).

It was agreed that the author would direct the fieldwork required for this thesis. However, Prof. Radić has been fully supportive of all methodologies, no matter how "foreign" or tedious they seemed. He is a vital component of the ongoing research and has been enthusiastic in detailing various known archaeological sites to the author, as well as indicating the proper routes to remote areas on the island. Unfortunately, Prof.

Radić spent most of the 1993-95 seasons in the Croatian Reserve Army, so much of the fieldwork for this thesis was done in his absence, and more often than not, solely by the author.

Predrag Novaković from the Department of Archaeology, University of Ljubljana, Slovenia, is also one of the principal investigators of the KARG. Novaković's interest in the archaeology of Korčula stems from his own work on the nearby island of Hvar in the 1980s. As a current postgraduate research student (as of 1997), Novaković's research area covers northern Slovenia and eastern Italy and does not specifically focus on Korčula or South Dalmatia. However, plans have been made for a larger project stemming from both the author's research and general KARG investigations, so Novaković has traveled at his own expense to familiarize himself with the future study area.

Asja Zec (Zagreb) has also assisted over various seasons with field survey. More recently (1996 to present), Dr. Philippe Della Casa and Dr. Biljana Schmid-Sikimić (*Ur- und frügeschichte*, University of Zürich, Switzerland) have taken part in certain investigations on the island. Likewise, various local islanders, such as Aldo Mirošević (Advocat, *ex* Vela Luka), Jadranko Oreb (*ex* Vela Luka), and Ante Mirošević (*ex* Vela Luka) have assisted with both the fieldwork and processing of materials. Neven Fazinić (ex Korčula) has transported the author to the various islands off the eastern end of Korčula and has brought numerous limestone cairns to the author's attention. Ana Radmilović from the University of Zagreb, Department of Archaeology, has also assisted in the fieldwork.

1.1.3 The Facilities Used for the Thesis Research

When the island was part of the former Yugoslavia, minimal funding was given to Prof. Radić for the cultural center or the museum. Most of the exhibits, displays, and artifact conservation were done with the help of numerous enthusiastic villagers and in a few instances, with help from various Yugoslav university members and Yugoslav Academy of Sciences personnel. The actual facility at the *Centar za kulturu* is quite large and includes three floors with numerous lecture, display, and storage rooms, plus a permanent archaeological exhibit and numismatic collection. The *Centar* also contains the public library for the village of Vela Luka. Prof. Radić arranged for a small office and work space for the author, and all photocopy and fax services required for the research have been covered *gratis* by the *Centar za kulturu*.

1.1.4 Funding for the Research

All financial assistance for the project came via numerous academic scholarships from the U.S.A. and the Abercromby Student Travel Fund from the Department of Archaeology, University of Edinburgh. Due to the war (which did not physically affect Korčula) and recent Croatian independence, most western currencies were readily accepted with very good returns in local currency[1]. It should be noted that rent for a small flat on the island has been arranged consistently at ca. £ 100.00 for each consecutive summer season. Likewise, a special arrangement was made with the tuna cannery in Vela Luka for bulk purchase of canned fish for use during the fieldwork. Coupled with the low prices of locally grown or caught products, it should be clear that the costs for each season were incredibly low.

1.2 General Comments on Archaeology During & After Croatian Independence

There is no need to explore the various aspects of the recent conflicts in the former Yugoslavia. However, a few comments should be made regarding the conflict and the effects it has had on the archaeological record. Not counting the *stari most* or old bridge of Mostar, destroyed by Croat shelling in 1993 (see comments by Chippindale 1994: 1-2), many areas of the former Yugoslavia's archaeological record were either damaged or completely destroyed.

Among other atrocities to cultural heritage, Chapman pointed out not only the direct damage a *Jugoslovenska Narodna Armija* (JNA) tank regiment inflicted on the well known prehistoric site of Vučedol, in eastern Slavonia, but also the fact that all artifacts from the museums in Vukovar and Vinkovci were transported to Belgrade by the JNA (1994: 124). Likewise, all hilltop sites investigated by the Neothermal Dalmatia Project (Chapman et al. 1990; Batović and Chapman 1985; Chapman et al. 1987) were impacted by JNA bunkering and related military activities (Chapman 1994: 124). Croatian efforts to account for the damaged areas have been published by the Hrvatsko Arheološko Društvo (e.g. 1992: 23-30; 1993: 12-19). Other archaeological researchers have also discussed the conflict and the political, economical, historical, ideological, and ethnic parameters that have ushered in certain new realities (e.g. Kaiser 1995).

It would appear that sites and monuments records could find a place never before imagined in past researches; the sole documentation for monuments, sites, and artifacts, either totally destroyed, damaged beyond repair, or looted from national museums. While these activities are not new to this century, the impact these recent events have had on the archaeological and historical record is still beyond estimation.

However, the normal building construction, agricultural activities, re-distribution of lands, re-allocation of agricultural areas, and the encroaching tourism industry can play just as large a role in the destruction of archaeological and historical sites. During the author's research, at least one prehistoric cairn was totally destroyed to make way for the construction of a fire break near Lumbarda, on Korčula's east end. It would have been quite simple for a local administrative body to have a person in the field to monitor this activity, but since the author's work had only just begun, there was no "sites and monuments registry" to consult. In this case, the bulldozer did not need to cut through the obvious tumulus. However, the crew would have needed to make a fifteen meter detour that was clearly deemed unnecessary at the time.

The place of public sites and monuments registries in areas such as the Dalmatian Coast is paramount. Although funds might not be readily available for special protection, local officials and specialists can take necessary actions to protect archaeological sites. The newly published first volume of the Adriatic Islands Project (AIP), covering the Croatian island of Hvar (Gaffney et al. 1997), clearly indicates that not only is this monitoring possible, but that it has already been taken into account by local personnel (see Franičević commentary in Gaffney et al. 1997: ii).

As a final note concerning the aforementioned AIP volume, the text was just published in early February 1997 and consequently, the author has not had time to consult this as a standard reference. However, it is clear that the author's research and the AIP publications will be compatible. This is apparent not only regarding the computerized databases, but also the similar nature of the formats for documentation and analysis of the archaeological record of the Central and Southern Dalmatian islands.

1.3 Goals of the Research

This thesis has numerous goals, with many aimed at future research plans on Korčula by the author. As the title of this work implies, the thesis seeks to assess the prehistoric and protohistoric archaeological evidence on the island. As discussed in the previous sections, this research is the first of its kind on Korčula, so it has been necessary to plan out all aspects of field research. As will be detailed in the text, this includes not only a thorough research design, but also establishment of a useable and transferable computer database, and a reliable and coherent system of field data recording and artifact processing.

The body of evidence, results, and conclusions, demands an ability to be carried into future research, not only on Korčula, but elsewhere in the region. It is because of

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[1] By the middle of the second season (Summer 1994), the *Dinar* was replaced by the *Kuna*, which is the present currency of Croatia. More expensive products are usually quoted in *Deutschmarks* with many villagers preferring that currency for its stability and general regional acceptance.

this latter reason that the research for this thesis has also been laid down as the provisional sites and monuments registry for the island. All survey records are permanently kept on file in the Arheološki muzej in Vela Luka. Naturally, many techniques applied to other surveys in the Mediterranean could not be applied here due to the nature of the research, certain financial limitations, and to a lesser extent, the regional troubles. However, all goals that could reasonably be achieved under the conditions of this research were reached. Numerous avenues have also been explored for future studies on the island based on data collected and evaluated for this thesis. As will be detailed in the following sections, these include soil deposition studies, specialized sediment analysis, x-ray diffraction (XRD) and x-ray fluorescence (XRF) for provenance studies on clays and pottery.

Finally, the intentions of this research were not to conduct fieldwork over a few seasons and abandon the island, leaving only published traces of the investigations. This thesis is the foundation and springboard for more extensive future research on Korčula. The final synthesis of the data will reveal that Korčula has a data set which, while not particular to the region, could prove to be more archaeologically and geographically defined, and hence pertinent to various regional studies.

Chapter Two

General Background Information Regarding Korčula

2.0 Korčula: General Description

Although there are no recent studies of the floral or faunal species on the island, it is possible to give a fairly good overview from numerous published sources. In a few instances, the published materials have been completely incorrect regarding the presence of local fauna. The author has discovered that many species (e.g. Mediterranean seals and the Dalmatian jackal), have unfortunately become extinct on the island, if not throughout the entire region. The presence of flora not mentioned in the literature should not go unnoticed. For example, remote and wild pear tree stands have been recorded during the surveys that are without mention in the general literature. Hopefully, the island's flora and fauna will be studied in the near future to protect any threatened species.

2.1 Regional and Local Geography

Korčula belongs to the group of Croatian islands that are commonly referred to as the Middle Dalmatian or Central Dalmatian island group. This has been not only a geographic label (e.g. Kalogjera 1985: 20), but also a useful academic label for recent archaeological research (Forenbaher et al. 1993: 14). However, the region Korčula lies in is actually known as South Dalmatia. Line-of-site visibility is possible to all of the neighboring islands from many higher positions on the island, including the tiny island of Palagruža on clear days. In the winter, on the higher positions such as Hum and Kom, the hazy outline of the Italian coast is barely visible on the horizon (see plate 3). This inter-position visibility will in fact form a major part of the discussion in this thesis.

Korčula's name in antiquity, Corcyra (Kerkira) Melaina, Crna Korkira, Korcyra Nigra, or Black Corcyra, stems from Korčula's dark pine forest (Appolonius Rhodius N. 569). A Greek colony was supposedly established there by the Cnidians (Pseudo-Scymnus 421, Strabo 315, Pliny: III, 152), with connections to the original Greek Corcyra (Kerkira), which is of course Korfu. The story of how this name came to be, and whether there was in fact a Late Archaic Greek colony there at all, is rather long, still disputed, and outside the scope of this paper. This has been discussed in greater detail elsewhere (e.g. Beaumont 1936: 174, Lisičar 1950: 51-125, Wilkes 1969: 8,9, and Kirigin 1990: 293). Nevertheless, Korčula still has one of the densest forests found on the Adriatic islands.

For reference, during the Venetian and later Austro-Hungarian Empire occupations, Korčula was also known as *Curzola.*

Korčula's landscape is roughly a mixture of small fields, karst valleys, hills, large polje, high karst peaks, and cliffs. The island is surrounded by many islets and has a coastline that is etched with bays and harbors of various sizes. The oft cited Strabo even noted: "...the whole Illyrian (Dalmatian) seaboard is exceedingly well supplied with harbours, not only on the continuous coast itself but also in the neighboring islands..." (5.10).

The actual island of Korčula has a surface area of approximately 276 km^2 and is ranked as the sixth largest island in the Adriatic. The island is approximately 47 kilometers long, with the width roughly averaging between 5.3 kilometers (between the bays of Ripna and Teklina), and 7.8 kilometers (between Prigradica Bay and the small Ratak peninsula). The length of the coast of Korčula is 182 kilometers. If the coastal lengths of the many islets are added to this figure, then the coastal length is approximately 235 kilometers. The highest peak on the island, Klupca, lies roughly in the middle of Korčula at an elevation of 568 meters above sea level (masl).

The southeast coast of the island is fairly jagged and steep, with many of the cliffs extending along the southern coast of the island and reaching up to 20 meters in height. This feature has been generally attributed to the exposure of the southern part of the island to the southern open seas of the Adriatic, although geologic attributes obviously play a major factor. The northern coast of Korčula is milder in its relief and the seas there are more predictable. The southwestern coast of the island, towards Tri Luke (*Tri Porte*), is equally as mild with relatively few cliffs and numerous small islets that act as buffers between the main coast of Korčula and the south seas and winds.

Korčula is divided from the Pelješac Peninsula, due northeast, by a rather narrow channel known as the Pelješac Channel (figs. 2 and 3). For reference, the highest peak on the Pelješac Peninsula is Sv. Ilija, which rises to 961 masl. The distance between the Pelješac Peninsula and Korčula is 1.2 nautical miles (1.4 kilometers), and the winds generated between these two landmasses are strong and persistent. Likewise, the topographic maps reveal that the steep topography of the Pelješac Peninsula, coupled with the proximity to Korčula, would tend to generate rather strong winds through the channel.

2.2 Winds and Climate

The winds in this part of the Adriatic are generally known as the *bura* (north wind), *yugo* (south wind), and the *maestral* (northwest wind). It should be noted that there are minor variations among the Adriatic islands regarding the names of the winds

(see Forenbaher et al. 1994: 31), but this can largely be attributed to communities and dialects, rather than meteorological differences. The *bura* blows more frequently in the winter months, and the *jugo* and *maestral* are prevalent during the summer.

A more intensive examination of the local Korčulan names for the winds reveals numerous terms which are applied for specific wind directions and intensities. Villagers were consulted in Vela Luka to give some insight into these names. The local terms clearly reflect the fishing heritage of this village, and the importance placed on these winds for a maritime economy.

Villagers from Vela Luka refer to the *yugo* when the winds originate more from a southeast direction. As stated above, the *maestral* indicates winds from the west. The *bura* is more of a northwest wind, sometimes referred to as the *vranac*. *Vranac* happens to be a geographic toponym on the northwest side of the Vela Luka harbor and it is from that direction which these winds descend onto the town. The *levant* winds are generated from the east. The *grbin*, or *libić* in older Vela Luka dialect, has a southwest tendency. If this same wind increases in intensity, it is referred to locally as the *libićada*. The *tremontana* (or *tremuntana* in the Vela Luka dialect) are winds that come from the north. The *pulentada* is similar to the *maestral*, but the origins of the wind tend to be more from the southwest. The *šiloko*, referred to elsewhere as the *scirrocco*, originates from the southeast. The *grego-levante* is from the east, but with more of a northeast origin than the standard *levant*. Finally, the *šiloko-levante* winds are those which originate from the east, but with more of a southeast origin than the *levant* wind.

The climate of Korčula is of the typical Mediterranean-type and quite often referred to as the Adriatic variant. The summer temperatures are relatively high and average 25.6 ° C, while the winter averages approximately 9.1° C. The rainfall on Korčula has been estimated to be 1088 mm/ m^2 annually. The January mean temperature of Korčula (9.1° C) can be compared to Nice (8.0° C), Naples (8.2° C), and Dubrovnik (8.7° C), for reference. Vela Luka has recorded an average of 2671 hours of sunshine hours per annum, apparently the highest figure for the Adriatic Basin.

2.3 Sea water and Currents

The seawater around Korčula does not vary greatly from the rest of the Adriatic, but there are a few specific aspects that do differ and should be discussed. The salinity of the seawater ranges on average between 37.20% and 38.39%. However, there is a drop in the salinity along the north and northwest coasts of Korčula due to the effects of the Neretva River emptying into the adjacent sea. The Neretva River flows into the Adriatic on the northeast side of the Pelješac Peninsula and enters into the Neretva Channel. This current then follows the northern leading edge of the Pelješac Peninsula,

and flows into the Korčula Channel (see fig. 3). Here, the sea currents can average 3 knots. Eventually, this mixture of fresh and seawater contacts the northwestern coasts of Korčula. Along with a variation in salinity, the current also brings nutrient rich water that creates an ideal marine environment for fishing and related resource exploitations.

The temperature of the sea range from 21° C to 24° C in the summer, with temperatures reaching almost 28° C. along the coastal or surf zones. During winter, the temperatures average between 12° C and 13.50° C. Sea visibility can generally range from 10 m to 30 m in summer or winter, depending on local conditions.

2.4 Fresh Water Resources

As with other Eastern Adriatic islands, Korčula has the usual dilemma of fresh water availability. The large water table under the Blatsko polje is not capable of supporting the island's various communities. This pushed the need for the extensive fresh water pipeline extending from the Neretva River to the island. Notably, the Blatsko polje was formerly a wetland area drained by the Austro-Hungarian Empire towards the end of the 19th century to allow farming on this land. A similar situation has been documented in the northern Dalmatian region known as the Nadinsko polje, near Zadar, involving the drainage of lands for farming (Chapman et al. 1988: 36,37). The limestone geology of the island, with a core of Cretaceous dolomite, is impermeable to ground water and allows for "pockets" of fresh water to occur near the surface, but not massive ground water collection. The area known as *Sitnica*, just east of Potirna, has visible surface fresh water in the form of a seasonal marsh or pond (*lokve*). This might have been the situation, only on a larger scale, in the Blatsko polje.

Numerous freshwater springs occur on the island. The Mala Kapja field and the eastern part of the Sločajna have visible surface water springs. The time honored practice of digging cisterns to collect rain and some ground waters is still widely practiced on Korčula. There are areas of the island that also contain unsuitable water for drinking and farming. The Donje blato, a quaternary deposit situated on Korčula's eastern end, has a high salinity content and has therefore rendered the area unusable for farming at present. This situation has also been geologically documented on the island of Brač (Čubraković 1984: 17-22) and archaeologically discussed (Čače et al. 1995: 16).

2.5 Flora Types Present on Korčula

Evergreen vegetation is currently predominant on Korčula. The flora detailed in this section chiefly concern the most common species found on the island. Certain

related aspects of the vegetation will be discussed in the palaeo-environmental section (Chapter 4).

All species reflect the typical post-glacial Mediterranean-type environment. Specifically on Korčula, the drought resistant macchia (known locally as *makija*), the summer-dry evergreen forest (such as *Quercus* and *Pistacea*), other typical Mediterranean trees (such as *Olea*), and an array of pines, predominate. These have been recognized as diagnostic, if not generally typical, throughout the Mediterranean basin (Roberts 1989: 137,138).

Many recent imports have come to the island from inhabitants living abroad or from other parts of the Balkans. A good example of this might be the lone pear tree found on a rather remote position on Korčula. Abandoned by the local farmer (s), this tree, found at the base of the KS-014 (Hum) prehistoric hilltop structure, still bears fruit.

No extensive or recent faunal studies have been conducted on Korčula or the immediate coast. Information gathered from core tests on the nearby island of Mjlet in the early 1960s (Beug 1961, 1967), have revealed important palaeo-environmental information. Unfortunately, the last 1900 years are not represented in the core sample (Beug 1967: 271 276-277), and while vegetation trends could easily be seen in the later (newer) limits of the core, overall pollen and vegetation cover from 1800 B.P. up to the present must be gleaned from alternate sources. Also, the extensive Roman occupations, dating from the 3rd century B.C, and the many imported plants that were brought along, must be considered. Currently, only the Dalmatian Pine (*Pinus nigra* ssp. *dalmatica*), is known as a native to Korčula.

2.5.1 Evergreens

The Dalmatian Pine (*Pinus nigra* ssp. *dalmatica*) is abundant on the island of Korčula and is recognized as the only Postglacial pine species native to the Dalmatian coast (Beug 1967: 277). The Aleppo pine (*Pinus halepensis*), known as the source for the Greek wine known as "retsina", has been shown to be a probable native pine species to Dalmatia (Beug 1961: 633). However, it is still unclear whether those *halepensis* found specifically on Korčula were native or imported. The Italian Stone Pine (*Pinus pinea*) is also found on Korčula, but has been recognized as a non-native import to the Eastern Adriatic coast and islands (Beug 1961: 633-635).

Cypress (*Cypressus semper virens*) and Holm Oak or Holly Oak (*Quercus ilex*) are also present on Korčula. The latter, with its hard and durable wood, has been used locally for vine props, joinery, and ship building. Other evergreen trees found on Korčula include the Viburnum (*Viburnum tinus*), Juniper Tree (*Juniperus phoenicea*), Pistachio (*Pistacia terebinthus*), and the Laurel (*Laurus nobilis*). The Laurel is another

imported species dating to the Roman occupations on Korčula. Besides a common cooking use, this evergreen is best known from antiquity as the wreath that was worn around the heads of certain dignified and honored Romans.

Local shrubs include the macchia, or makija, a very hearty evergreen plant that has been shown (on the nearby island of Mjlet) to be imported and possibly used for animal grazing purposes (Beug 1967), and noted elsewhere as anthropomorphic in origin (Roberts 1989:139). The garrigue is another local type of vegetation primarily comprised of *Erica arborea* (Heather) and *Cistus*, a type of small shrub. Perhaps a point of importance concerning the cultural occupations is the fact that the garrague-type will only grow once the evergreen makija has been grazed or burned away. As will be discussed later, core samples from the nearby island of Mjlet (see figs. 2 and 4) have shown that the inverse was the case (garrague present before makija), suggesting that there was no anthropogenic involvement in the spread of the local vegetation (Beug 1967: 273, 276).

2.5.2 Palms

Numerous palms, mostly *Palmae canariensis,* have been introduced onto the island. The Mediterranean climate on Korčula has proved to be an ideal setting for these tropical and subtropical monocotyledonous trees. Some of the palms have self-planted on the terrain, possibly due to seed dispersion by birds. A number of these palms (species uncertain) can be seen on abandoned wine terraces at the eastern end of the Blatsko polje, near the Mala Krtinja polje. More recently, the town of Vela Luka has cut down some of the Italian Stone Pines along the harbor's edge and replaced them with palms, perhaps to create more of a *Riviera* atmosphere.

2.5.3 Other Shrubs and Medicinal Plants

The Cherub (*Ceratinia siliqua*), and the Myrtle (*Myrthus comunis*), are also found on Korčula. Medicinal plants include Sage (*Salvia officinalis*), Rosemary (*Rosemarinus officinalis*), Lavender (*Lavandula officinalis*), and Immortelle (*Helichrysum italicum*). Smilax (*Smilac aspera*), Strawberry rice (*Arbutus inede*), and bramble (*Paliurus spina cristi*), are also common on the landscape of Korčula (Kalogjera 1985:21-22).

2.5.4 Common Agricultural and Domestic Flora

Korčula has an abundance of Fig trees (*Ficus carica*), which bear the known fruits that can be dried, tinned, sugared, or eaten raw. These can be found in many gardens and around the edges of many polje (fields). Many Fig trees have gone

abandoned in areas that are no longer maintained by the local farmers. The village of Smokvica might have a history of this crop, although there is no evidence of this at the present. "Smokva" is Croatian for fig, and the name Smokvica literally translates as "...the little fig".

Plums (*Prunus domestica* and *Prunus italica*) known in Croatian as *šljiva* are also found on the island, although none appear to be found in large orchards. These fruits are processed to make the popular plum brandy known as *šljivavic*, however most plum tree stands no longer appear to be maintained. The KARG has found many remote localities completely overgrown with abandoned plum trees, such as the eastern end of the Morkan polje.

Cherry Laurel (*Prunus laurocerasus*) are found on Korčula. Most of the known cherry trees are well maintained by the local landowners, and unless unseasonable conditions occur, most bear fruit towards the end of June and into July. No cherry trees have been detected in an abandoned state on the landscape during the survey.

Anther import brought over to Dalmatia is the tomato (*Lycopersicon esculentum*). These are common in the diet of the Dalmatian islanders and coastal dwellers. Most of Dalmatia still refers to the tomato as the *pomodoro*, due to extensive former ties with both the Venetians, and later, the Italians.

2.5.5 The Olive and the Vine

The Olive tree (*Olea oleastrum*) is quite prevalent on the island. Many families own at least a few of these Grecko-Roman imports, although the extent of the species throughout Korčula during antiquity is unknown. Some older olive trees have been documented on the island, such as those on the western edge of the Brdat polje. These occur near documented Roman villa rustica sites and makes their provenance highly suspect. There are a few commercial oil-processing firms (*uljarije*) on the island, although most do not necessarily own large areas of land for their crops. It is common for local village growers to sell their private olive crops to these larger olive oil processing firms, which reflects a cooperative approach to agriculture.

From the end of the 1800's through to the late early 1900's, massive terracing efforts on Korčula insured that almost the entire island was terraced for wine production. During this period, the island's economy was based almost entirely on these vineyards. However, olive trees were used as a replacement crop after the Phylloxera and Peronospora (vine diseases) spread to many of the islands between the First and Second World Wars. Even though most of the vine crops were totally destroyed, some areas must have been active. During his investigations, Beaumont noted Korčula's vineyards and their ability to hinder archaeological research (1936: 163).

Between the First and Second World Wars, a radical transition began to take place on these terraces that had a direct effect on the Aeolian processes. The Phylloxera and Peronospora diseases attacked the entire vineyard system on the island, killing off the vines and rendering the soils, for the time, equally useless. The Second World War insured a massive migration of the local population of Korčula to various overseas locations, leaving the once extensive terrace systems to go unmanaged and the soils fallow. Finally, after the Second World War, the basic economy of the island shifted to shipbuilding and other state sponsored manufacturing for the former Yugoslav government. Most of the terraced vines were never replanted, although privately owned plots and a few commercial vineyards were re-established. Other areas that were once reserved for vines were rehabilitated with the less temperamental olive tree.

The vineyards from Korčula produce many well known Dalmatian wines. The Greek geographer Strabo even noted the ideal setting of the Dalmatian lands to support the vine [2]. Prior to the Second World War, the island's economy was primarily centered on wine production, along with olive oil processing, fishing and smaller ship construction. However, the wines produced here seem to have had a great allure.

The famous *Grk* wine (*Grk* translates from the Croatian as "Greek"), produced from the vines grown in the Lumbarda polje, has had a rather high profile recognition. The British commando and MP, Sir Fitzroy Maclean, personal emissary of Winston Churchill to Tito during the Second World War, parachuted into the Balkans and eventually linked up with the Partisans who were operating on Korčula. After his arrival in the old Venetian port of Korčula town, he noted :

> "...The wine, a sunny Dalmatian vintage from the islands (Korčula), called, with admirable succinctness, *grk*, was heady and delicious, and soon we were all engaged in animated conversation...." (1949: 367).

Perhaps a more pertinent point concerning the archaeological landscape of Korčula is the fact that the Lumbarda polje is a possible location for the elusive colony of the Greek Cnidians, and possibly the location of the later Issian colony [3]. Remains of these two colonies have not been found, but as previously mentioned, the topic always produces a good debate among interested archaeologists and historians. Nevertheless, it is suspicious that the possible position of these two colonies on Korčula is on the same piece of land which produces the well regarded and ancient wine called *Grk*, or "Greek."

The towns of Smokvica and Čara produce a wine known as *Pošip*. Most of the Čarsko polje, as well as the Smokvica Sitnica field, are used as the growing region for

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[2] Strabo: 7.5.10, and see sections 2.2 and 8.3 for further information concerning Strabo's text.
[3] See section 1.1 for the Cnidian references, or the site record of KL-009, for information of the inscriptions found on the Psephisma, possibly relating to the Issian colony.

these special grapes. Law protects this wine and the grape (known by the same name), and survey in these areas during certain times of the year is not always welcome. The main wine production firm in Smokvica also handles the commercial production of the table wines known as *Admiral* and *Maraština*. The grapes from these wines also come from private producers and growers on Korčula (see fig. 3 for the growing localities of the grapes).

Finally, many of the villagers have their own smaller vineyards. Sometimes these are in lands owned by one or more of the family members, often located outside of the actual village. Many of the vines can even be found on the village dwellings as canopies creeping across the top of the balconies. These are not for show, however, as many villagers take much pride in their home-produced wines. Towards the end of summer, after the vintage has been consumed, the traditional wooden casks of all sizes can be found down by the shore or along the edges of the small harbors. The casks are then washed, water-logged to allow the expansion the wood, and hence sealed against leaks, and taken back to the house, ready to be filled with the next batch of wine.

2.6 Fauna Found on Korčula

A broad range of fauna live on Korčula and in the waters nearby. Unfortunately, many recent faunal studies are based on outdated information and tend to be quite unreliable (e.g. Gjivoje 1972a; Kalogjera 1985).

2.6.1 Terrestrial Faunal Species

The Dalmatian jackal (*Canis aureus dalmaticus*) once lived on the island. Presently, there are no verified jackals on Korčula and no information exists as to where the nearest living specimens, if any, can be found. Some villagers from Vela Luka reported to the author that the demise of the jackal was brought about by a canine disease (type unknown). Locals from Vela Luka say that as recently as ten years ago, the jackal was found lurking about and heard howling late at night. Some people from Vela Luka report that a few jackals might still be living on the extreme western end of the island in an area known as *Privala*. This area now belongs to the Croatian military, so verification of the jackal's presence there is difficult.

An early travel writer's account (Holbach 1910), dating to the period of Austro-Hungarian occupation of Dalmatia (ca. 1906), gives exhaustive details about the jackals on Korčula. Their natural habitat was described as Korčula and the neighboring Pelješac Peninsula. Accounts of the jackal's activities on Korčula were described by the local islanders to the aforementioned author.

Concerning the jackal's origins, one villager speculated that the Venetians brought it to the island to destroy the native islander's flocks and bring them into submission for Venetian control. However, Holbach rightly states that the jackal was known in other parts of the Dalmatian coast, and hence must be indigenous (Holbach 1910: 25, 26)..

In any case, the islanders who were active in hunting the jackals on Korčula told the author that the animals must have numbered in the hundreds. An area reported to be inhabited by the jackals was the Račišće locality (fig. 3) on the northern coast of Korčula. It was reported that people were kept awake at night by a "...strange weird howling...", and that some jackals were actually made into pets. It was also reported that the jackals would dig up and devour corpses, and that the souls of the dead, unable to rest, would take the form of jackals. It was for this latter reason that some of the villagers feared hunting the jackal, and as the author pointed out, "...the islanders are not a little superstitious." (ibid., 202).

In the village of Pupnat (fig. 3), a night watch had to be posted to warn the villagers of the jackal's approach. Perhaps a cultural insight was the story that:

> "...the man who succeeds in shooting a jackal is the hero of the village, and receives a present of two eggs and two loaves of bread from every member of the community...(but that) ...the presents are not all made in kind...the hunter is rewarded only by the heads of families and the wealthier inhabitants. At all events, the dead jackal is dragged round the village, for every one to see, amid great rejoicings. The animals are said to be fond of grapes, and just before the harvest visit the vineyards in sparsely populated parts of the island, where there are no farmlands to be raided for lambs or poultry." (Holbach 1910: 201, 202).

As a final and insightful note, Holbach assessed the situation concerning the jackal and claimed that within one hundred years, the jackal would probably be extinct and "...the beautiful Curzola will have lost one of the chief interests of her forests." (ibid., 203). As stated earlier, this seems to be the unfortunate situation.

Archaeologically, no evidence has been produced in any local faunal collections to suggest that the jackal had an appearance in earlier periods. This would tend to make the animal's provenience highly suspect. The jackal might have been native to the coast, but the question still remains as to when it arrived on Korčula. Implications concerning types of domesticated animals being raised or bred on the island in antiquity coinciding with the presence of the jackal are paramount for resource exploitation examinations. A predatory animal such as the jackal must have something to hunt. It is highly unlikely that the jackal would have been on Korčula, at least not in large numbers, if there was

not a sufficient food supply. The rather large faunal collection that was excavated in Vela špilja (KV-014), with occupations dating from the Early Neolithic through to Late Roman times, has not been examined sufficiently enough to reveal the presence or absence of the jackal. However, it should be noted that prehistoric dog (*Canis familiaris intermedius*) has been identified in the Neolithic levels in Vela spilja. At the present, this is the only faunal "collection" from Korčula's prehistory.

The mongoose (*Herpestes mangus*) is a common sight on the island. These were probably brought to the island by sailors during Venetian times, possibly dating to the time of Venetian sailor Marco Polo and his residence in Korčula town (ca. 1254-1324). They have by no means infested the island, as is seen on certain Caribbean islands visited by early Spanish and Venetian sailors, but they can usually be spotted on the terrain or running across the main island road.

Many locals claim that these animals have terminated Korčula's snake population. Even older farmers claim that there are no snakes on the island. However, on more than a dozen occasions, the members of the survey for this research have come across snakes, not only in the remote areas of the island, but also basking on the tarmac in the mid-day heat. These have been identified as two separate species. One type is similar in appearance to the common garter snake (possibly *Thamnophis*), and the other is probably the small brown poisonous viper known from the Pelješac Peninsula (*Vipera berus*).

Other wild animals also include the wild boar and pheasant. The small Mufflon deer have been recently spotted during the survey (Summer 1995) on the small islet of Sridnjak, just off the southern coast of Korčula, although the background as to how they came to be on this rather small islet is not clear. The island of Badija is also home to wild hare and deer, although no deer at the present live on Korčula island proper. Common domestic animals spotted on the Korčula include numerous cats, dogs, pigs, goats, donkey (*tovar*), a few sheep, an occasional cow, and mules.

2.6.2 Marine Faunal Species and Fishing

The Mediterranean seal (*Monachus albiventar*) has been listed as a local in the waters around Korčula. Unfortunately, like the jackal this is no longer the case. Formal (informant) interviews with many of the local islanders shed some interesting light on the fate of these seals. Considering the fact that seal remains date as far back as the Early Neolithic occupations on the island (ca. 8000 B.P.), this topic warrants further description.

Aldo Mirošević (pers. com.) has detailed his own knowledge about the Mediterranean seals and about his grandfather's stories concerning the seals in the bay

of Vela Luka. This would put the time of incident at roughly the end of the 1800's through to the 1950's.

> "...The seals went by the name of *medvjedica* (sea bear: female) or *morskičovik* (sea man). They still go by these names, but none are here. My grandfather said that they used to shoot them because they bit holes in the fishing nets. He also said they once swam a lot near what is now the site of the Hotel Jadran (situated on the southern side of the bay of Vela Luka). Once, a seal even bit his finger while he was fishing. Well, anyway, I remember a story going around in about 1966 or 1967 that nobody saw the seals too much. Then in 1979, there was an offer of 10,000 *Deutschmarks* to bring in a seal to be a mascot for the Split Games. Apparently it (the Mediterranean seal) was a former mascot of some of the teams there (in Split). Well, in the end, nobody found one in all of the (Croatian) Adriatic."

This situation will be examined in further detail concerning the resource exploitations during the island's prehistory. The point here is to incorporate anthropological, environmental, and ecological survey evidence into the study of the island's known resources, and specifically, to facilitate an examination of those species linked to the prehistory.

The inhabitants of Korčula, like those on the other Dalmatian islands, are an experienced fishing population. This pursuit along with wine and olive oil was not only a livelihood, but also a means of vital means of subsistence. The town of Vela Luka has a large fish cannery known as *Jadranka* that has been in operation since 1882. Here, local varieties of tuna, mackerel, and sardines are canned and sent to local and distant destinations for consumption.

At the local fish markets on Korčula, known in island dialect as *pescaria* (once again from the Italian connections), three classes of fish are recognized for consumption. The so-called "first class" fish, often called *riba od kamena* (fish from the rocks), include the white meat fish, such as the *Zubatac* (possibly *Perca labrax*) or the good white meat tunas. However, tuna are not frequently seen for sale in the *pescaria*, simply because the cannery will purchase these for a higher price. Likewise, not too many private fishermen pull in the big tunas anymore, as the catch has been left to local professional fishermen with long range and big haul capabilities. This has had an impact on the local prices for these first class fish. Presently, a good-sized *Zubatac* found in the *pescaria*, measuring 50 cm. or more, will command a local price of ca. $20.00-30.00 (£14.00-20.00).

The "second class" fish are the darker meat types, such as the mackerel (*Scomber scombrus* ssp. ?). The most popular variety of these second class fish is known locally as

the *Lokarda*. These can usually be found in the *pescaria* on most days, while the first class type's appearance tends to be sporadic at times.

The "third class" fish are mostly the smaller sardine types. A few species of *Sardinia* can be found in the *pescaria*. The larger variety is known locally as the *Sardella* (possibly *Sardinia pilchardus*) and measures 10-15 cm. in length. These are caught at night, using large lamps attached to the sterns of the fishing boats. The *Sardellas* are lured in and then scooped into nets. The fact that the light attracts these small fish makes it very difficult, if not impossible, to catch the type when the moon is full or in the immediate waxing or waning phase. Sardellas are beheaded and gutted in one quick maneuver. The fish are usually grilled or fried, but many locals also marinate the *Sardella*.

The smaller variety of *Sardinia* found in the pescaria of Korčula are known locally as the *Gavune*. These small fish measure from 5 to 10 cm. in length. The fish are not gutted when prepared for consumption. They are usually fried in olive oil and eaten whole.

Other common marine fauna seen in the pescaria include the octopus (*Octopus*), and in the winter months, squid (*Loligo* or *Ilex*), known as *Lignja*, are regularly caught. Sea urchin (class *Echinoidea*), known locally as *ježina*, are also found in the waters around Korčula, but it is unclear as to whether these are currently used as a subsistence, or merely what have been interpreted in archaeological contexts as "relishes" (Dieth 1988: 116-124). Most of the locals who dive for these sharp delicacies currently do it for sport and not for subsistence. No evidence of the sea urchin has been recorded in the archaeological assemblage from Vela špilja. The egg shell-like exoskeleton of the sea urchin does survive well in many archaeological contexts. The spiny needles of the urchin tend to be more resilient, but are often misdiagnosed as "tool-type needles" in collections examined by the untrained eye.

Concerning the availability of good fish (first or second class types) near the island's current settlements, Aldo Mirošević (from Vela Luka) stated that his grandfather used to catch the evening meal directly from the eastern end of the Vela Luka bay, directly in front of his house. Another informant (Dinko Lovričević), in a separate interview, claimed that his grandfather, during the time around the First World War, would regularly catch 10 kg. of first class fish with a 10 meter net in front of the shore area now occupied by the Hotel Jadran (southeast end of Vela Luka bay). Both of these informants admitted that they have no personal recollection or experience of the times when good fish were caught in the modern settlement area of Vela Luka harbor.

2.7 The Fishing Boats, Rowing, and Contact with Other Islands

The Dalmatian coast, and specifically Korčula and the nearby islands, have a long tradition of boat making and related seamanship skills. Sea battles that pitted the Greek triremes against the local small and light sea craft of the Dalmatian islanders have been documented as far back as 384 B.C. (Diod. Sic. 15.13.4-15, and 14.2). Throughout Medieval times, the Venetians used the Dalmatians as the backbone of the mighty Venetian navy, and early sea explorers, such as Marco Polo, are said to have included Dalmatians, many from Korčula, as crew on their vessels.

This heritage has carried over to the present day. Both Vela Luka and Korčula town have rather extensive shipyards that repair and manufacture specialized parts for all types of sea craft, from sailboats to freighters, frigates, and even unique and patented self contained rescue craft for high sea oil tankers. Vela Luka has an active sculling team that can be often be seen at practice in the early hours of the morning, when the bay is smooth. Likewise, many of the craft seen around the bays are still the traditional wooden *barka*, a craft that looks very much like a specialized and elongated rowboat.

In fact, these rowboats, without the common diesel motors found in many today, have been known to travel long distances. Three informants in the village of Vela Luka, Aldo Mirošević, aged 36, Ante Mirošević, aged 19, and Dinko Lovričević, aged 59 (all *ex* Vela Luka), separately discussed their knowledge of these *barka* and their many uses.

Figures 1 and 2 show the geographical relationship between Korčula, the other islands, the mainland, and the Italian coast. All informants specifically remember individual fishermen and in general, village stories, concerning local fisherman from Korčula who rowed these craft as far as the island of Vis to fish and trade fishing goods. The main fishing village on Vis is Komiža, located in the bay on the western side of the island. So, skirting the island upon arrival must have taken some extra effort. Some informants discussed fishermen who went on from Komiža to the small island of Palagruža, due south, and fished the rich mid-Adriatic currents near that small rocky outpost.

In the archaeological context, this information is particularly relevant. Recent archaeological research, including marine and terrestrial survey and land excavations, on the two small islands which actually comprise Palagruža, has revealed surface and sub-surface material dating as far back as the Early Neolithic (ca. 8000 B.P.), through to Eneolithic, Bronze and Iron Ages (Forenbaher et al. 1994: 36-45, Kirigin 1995: 61-66). A quarry was also found on Palagruža that revealed a vital and regionally scarce (regarding the eastern Adriatic) supply of fine-grained flint.

Recent research has already revealed that flint artifacts found in Krajicina Spilja (cave) on the island of Vis, dated to the Bronze Age (from associated pottery), show a

striking resemblance in color and grain size to the cherts quarried and worked on Palagruža (Kaiser and Vujnović 1995: 30-36, Tim Kaiser pers. com.). Other finds from this cave date from Early Neolithic, with the diagnostic *Cardium* (cockle shell) Impressed pottery, through to the Late Neolithic, known locally as the Hvar Culture, to the Iron Age. This information couples well with recent chert finds on Korčula (Bass and Radić in press: a) that also suggest a possible Palagruža source for the materials. These finds reveal rather important implications for trans- and pan- Adriatic trade routes and resource exploitations.

Perhaps the situation can be further visualized when coupled with the more anthropological data concerning fishermen. Concerning the information from Korčula, it is also of interest to note that prior to 1960 (the date which formally allowed regular "former" Yugoslavian citizens to travel abroad), there were numerous stories of islanders from Korčula who loaded supplies into these *barka* craft and rowed across the Adriatic to Italy. The village of Vela Luka still has a traditional *vesler,* or long oar maker (family Oreb), who manufactures specially crafted long distance oars from local timber. The blades of these oars are rather long (ca. 2-3 m.), but the surface area is rather small, permitting a less fatiguing stroke but allowing ample propulsion to cover long distances.

D. Lovričević also mentioned that it took fishermen roughly 8 hours to row from Vela Luka to Korčula town. Likewise, the village of Vela Luka has recently reinstated a traditional rowing race in these *barka* that, until July 1994, had not been run since 1945. At that time, claimed Lovričević and others from Vela Luka, the H.M.S. Viceres, a British Royal Navy frigate, was stationed off the coast of Korčula. The villagers challenged the crew of the Viceres to a rowing race, from a distance of ca. 15 km. outside of Vela Luka village to the end of the bay. The villagers won the race. But, as tradition always had it, at the finish line a big fish grill was prepared with local wine for all participants.

The resumption of this race in the summer of 1994[4] saw more than 10 *barka* craft, all sponsored by various communities in Vela Luka, compete in the race. The grilled *Sardellas* were once again served at the finish line, along with the local wine. The winners were from the village sculling club, naturally. It is perhaps of interest to note that the spot of the traditional race's start, the base of the Sv. Ivan Gradina, has a documented prehistoric hilltop structure (Bronze/ Iron Age), as well as Roman, Greek, and later Benedictine occupations (see sites KV-006, KV-007).

[4] The former Yugoslav government did not permit the race because it was held on St. John's Day and ran from the church of St. John "Sv. Ivan", at the end of the Vela Luka bay, to the actual village of Vela Luka. Religious related activities of this sort were not permitted during those times.

Chapter Three

Overview of the Geology, Soils, and Sedimentation on Korčula

3.0 Korčula: Geology and Soils

Unfortunately, the few geologic, relief, and soil references specifically concerning Korčula are rather brief and not particularly detailed (Gjivoje 1969a: 12-14, Kalogjera 1985: 16). Dinko Radić has indicated to the author that there is one recent publication, which might cover certain aspects in better detail, but the author did not have access to this during the final phases of this thesis. In any case, it has been possible to gather related geologic maps and minor references published in the former Yugoslavia. Likewise, it was possible to investigate the many geologic exposures as well as numerous soil deposits to obtain a more thorough understanding of their nature and how they directly or indirectly affect the archaeological record.

3.1 The General Geology

The geology of Korčula is like that on most of the Central Dalmatian islands. The Dalmatian Coast is generically classified as a karst or limestone formation. The region falls into the morphotectonic area recognized as the Alps and Dinarides, hence the name of the mountainous ridge running down the Dalmatian Coast, known as the Dinaric Alps (Gavrilović 1989: 202-203). Most of the geological exposures in the region are classified as Triassic in age, although Korčula is younger. The karst formations of the Dalmatian coast have many features which, when certain criteria are fulfilled, allow for excellent exploitation of the natural resources. The soils associated with the coastal and island karst formations are highly rich in nutrients, but unfortunately they are not always widespread. The ability of the karst landscape to hold water is also a great advantage, specifically on the islands. However, these underground pockets of fresh water can be depleted as demand increases. All of these aforementioned factors along with numerous others appear in the geological profile of Korčula.

3.1.1 Limestone, Dolomites, and Dolomitization

Korčula's bedrock formations consist of limestone, dolomite, and dolomitized limestone. Limestone is a sedimentary rock in origin and composed specifically of calcite, dolomite, or a combination of the two, while dolomite is formed as a result of magnesium bearing solutions reacting on or with common limestone. Generally, most

limestone contains some amount of magnesium carbonate and the term "dolomite" then simply refers to rocks containing 90% or more of the mineral $CaMg(CO_3)_2$.

Dolomitization is the process through which limestone is transformed into dolomite. Deeply buried limestone may become dolomitized if a mixture of fresh and sea water passes through the rock. In supratidal areas, sea water can also infiltrate the sediment's pore space through constant contact. Evaporation of the waters in the rock can result, causing a higher ratio of magnesium to calcium in the waters trapped in the limestone pores. As the magnesium carbonate percentage levels rise and the calcium percentage falls, the surrounding limestone rock undergoes the dolomitization diagenesis.

Dolomitized limestone and dolomites tend to be more porous than limestone and can act, in certain situations, as water reservoirs (Allaby 1990: 113-114). This cavernous character of the rock masses is an important feature in the Dalmatian landscape (Gavrilović 1989: 209), specifically on the islands where fresh water is not always in abundance. As discussed in Chapter 2, the fresh water table, trapped by structural geologic phenomena near the village of Blato, can no longer sustain the western half of Korčula's water demands. This depletion of the natural fresh water supply forced the construction of a fresh water pipeline from the Neretva River to Korčula.

The ability of the karst to hold water is also exploited by almost every household on the island, but in a somewhat indirect manner. Since the fresh water springs and *lokva* tend to be either too remote and too few, or contain water insufficient for drinking purposes, the islanders practice the time-honored method of cistern construction. Most cisterns used to collect rain water are dug or cut directly into the limestone or dolomitic limestone. Various types of catchment systems are then deployed to funnel the rainwater into these cisterns. Once the water is in the cistern, a cover is put into place. If sealed reasonably well, the rate of evaporation even during the hottest summer months is extremely low. Likewise, the water is kept quite cool and clean.

Other geologic features found on the karst, such as dolina and *lokva*, are also linked to the various geologic properties of the limestone and dolomitized limestone. Dolina can be described as valleys, dales, basins, or even sinkholes in the karst. Although the geologic reasons for specific formations of dolina can vary, most eventually form soil catchments or in some cases, water collection points. On the Slovenian karst landscape, dolina can readily be seen as large as one hectare in size, though many can be much smaller in dimension. Various modern adaptations of these dolina can be found, such as pens or grazing areas for domestic animals and as strategic areas to entrap and kill wild animals. Mesolithic artifacts have been found near a probable soil-filled dolina on Korčula (see appendices, site KP-019). Likewise, in the Zadar Lowlands and adjacent

areas, numerous sites ranging from Early Neolithic through to the Eneolithic have been found to be associated with dried up marsh areas and *lokva* (Chapman et al. 1990: 31, 32).

3.1.2 The Main Geologic Exposures

Korčula's surface geology consists primarily of limestone, dolomite, and dolomitized limestone exposures, with limestone breccia found in most areas. All of Korčula's geologic formations date roughly to the Mesozoic Era. The region of Korčula around *Brna* village, along the southern coast of the island, has been identified as an Upper Jurassic formation. As such, this area has the oldest geological exposures found on the island. This region has heavy limestone and dolomitized limestone exposures, an abundance of surface breccia and, except for a few isolated spots, very poor soils.

Korčula's central massif is exposure of the Lower Cretaceous period and occupies roughly 60% of the island's surface. Most of the better quality soils found on the island are associated with the *polje*, or fertile plains, found within this geologic formation. However, in a few areas along the edge of the formation, such as the Morkan and Prapratna polje (figs. 3 and 5), the rich soils are also mixed with alluvium from slopes of the aforementioned Upper Jurassic formation.

The northern section of the island, stretching from the small island of Proizd, off the western-most tip of Korčula, eastwards to the bay of Kneza, is exposure of the Upper Cretaceous period (*i.e.* the youngest outcrop). This geologic formation does contain certain sizable lowland areas with good soils, such as the Brdat polja, northwest of Vela Luka. However, most of the other soil localities in this area are quite small (well under 5 hectares in size).

3.2 Terra Rossa Soils

The younger soils from the Pleistocene are found above the limestone and dolomites. Almost exclusively, these consist of red soils, known as terra rossas, but in some cases, these are variations of the Pleistocene sands. Generally, the terra rossas are found in the karst recesses, valleys, or dolina. It should be noted that there are variations of this so called terra rossa, although if based on color alone, the soils might appear to be the same type. Some of the terra rossa soil types can be loamier than others, and in the areas of constant alluvial activities, the soils tend to be siltier. The terra rossas are widely distributed on Korčula, as can be seen on figure 5.

3.3 Aeolian Soils and the Aeolian Process

Aeolian soils (fig. 5), identified as Aeolian brown soils on Korčula, are fairly abundant and are found in a greater percentage in the large *polje*. Aeolian soils are generally formed by the erosion, transport, and consequent deposition of materials due to the action of winds, at or extremely near the surface of the terrain. Particularly pertinent to Korčula's soil deposition is the fact that the aeolian processes tend to be most effective when the vegetative cover is discontinuous or absent. Numerous post-Roman activities have occurred which have assisted this process. It might be argued that the results of these activities, while not being a regional exception, might be more pronounced due to extent of Venetian activities specific to the island and mentioned in the *Korčulanski Statut* (see Chapter 5 for primary discussion).

3.3 Anthropomorphic and Anthropogenic Soils

As indicated in the last section, anthropomorphic and anthropogenic soils are relatively abundant on Korčula, although the exact extent and nature of these soils has yet to be fully realized. These types of soils, as the names imply, are either generated from direct human distribution of soils or modifications of the landscape that facilitate the soil transport. Basically, almost all of the agriculturally based topsoils on Korčula are anthropomorphic in nature, regardless of the associated type (aeolian brown, terra rossa, or Pleistocene sands) found in the immediate area.

Numerous activities assist the process such as expansion of crop areas, clearing of brush, uprooting of unwanted weeds, introduction of other soils from different sources, aggressive plowing of new and old crop areas, and the clearing of unwanted stones and debris from the fields, referred to elsewhere in Dalmatian archaeology as "land enhancement" (Chapman and Shiel 1988: 35-37). Presently, except for the Donje blato area, all major lowland areas on Korčula with good quality soils are farmed or maintained on a year-round basis. From this standpoint alone, it is clear that localized soil transport is constantly occurring.

The Venetian document known as the *Korčulanski Statut,* recently republished (Jeličić 1995) but dating as far back as 1214, details legislation regarding the Medieval and Venetian occupations on Korčula. Specific points of the text which are of interest to the pedogenic analysis on the island concern logging associated with local ship building, house construction, lumber trade, widespread vineyard activities, and domestic animal grazing. In other areas of the Dalmatian coast, such as the Zadar lowlands, the ramifications of the Venetian impacts to the landscape have also been noted (Batović and Chapman 1985: 158). It is therefore reasonable to suggest that the deforestation and related activities to support the Venetian presence played a significant role in later

soil erosion and deposition on Korčula. As discussed previously, the Venetian activities were followed years later by extensive brush removal and forest clearance, which in turn had impacts on the landscape and the soils. This anthropomorphic activity naturally encouraged the increase of Aeolian processes and soil transport downslope and into the karst valleys and polje.

3.4 Sandy Soils

Sandy soils, or more specifically, Pleistocene sandy loams (mixtures of sand, silt, and clay) are also found on Korčula. These soils are found in parts of the Blatsko polje, Prapratna polje and, in a specifically nutrient rich location, Lumbarda (see figs. 3 and 5). Similar soil types have been noted previously with regards to archaeological studies on other Dalmatian islands (Forenbaher et al. 1994: 31) although specific connections to individual resource exploitations have not been made. As will be mentioned later in this chapter, the Pleistocene sands tend to be more dynamic that the other soils and possibly have the highest rate of transport, including the movement of artifacts from one locus to another.

3.5 Pedogenic Data Collected During the Field Survey

From the above discussion, it is clear that understanding Korčula's various pedogenic processes and associated stratigraphy is quite problematic at best. It is rather difficult to apply a case study from one part of the island to another without proper data regarding past "area specific" agricultural activities, primarily from the last two millennia. On Korčula, not many erosional areas with underlying and differentiating soil horizons are visible. Elsewhere on the Dalmatian karst, there are no pedogenic studies or profiles published specifically with archaeological research in mind. Therefore, the soils analysis on Korčula had to begin from "square one".

Numerous geographic localities on the island were investigated specifically for this thesis research to obtain a better understanding of the soils and the various natural and anthropogenic processes. During the Summer 1996 season, the author was shown a clay outcrop in the bay at Stiniva (Uvala Velika Stiniva), on Korčula's northwest coast (fig, 7), by Ante Mirošević. Originally, the author merely had intentions of documenting the clay outcrop, simply as a reference for landscape and resource studies. However, upon arrival to the general locality, it was clear that this pedogenic situation was quite unique for the island (see fig. 6). In all other localities, except for a highly organic humus horizon (an "A" horizon) and varying types of limestone bedrock (a "C" horizon), almost no evidence is ever apparent which would allow investigations into the pattern or nature of soil deposition. Since this is an integral part of any archaeological research

and vital to soil studies on Korčula, the author decided that a more intensive investigation of this site was required. The thorough description of the deposit, including numerous specialized analysis conducted on the materials and the connections that the clays may have to Korčula's archaeological record, will be detailed in Chapter 11.

3.6 Cave Sedimentation on Korčula: Preliminary Analysis

Korčula is completely lacking in publications discussing the various sedimentation or formation processes in the island's many caves, although there have been speleological references to the caves themselves (Girometta 1924, Gjivoje 1952, Gjivoje 1955, Božičević 1960). A more recent review of the speleological landscape of Korčula has classified at least 115 caves or caverns of various sizes, including rock overhangs, abysses, or other geologic cavities on the island (Božičević 1972: 209-214).

The three main caves visited during the this research were Vela spilja, Jakasova spilja, and during the Summer 1996 season, Spilja u istruškom dolcu (fig. 7, and see appendices b, sites KV-012, KZ-013, and KS-026). More complete archaeological details concerning Vela spilja and Jakasova spilja will be discussed in Chapter 5, but the general patterns of sedimentation observed in these caves will be discussed here.

3.6.1 Vela spilja: Natural Sedimentation Overview

Although Vela spilja has had many decades of archeological investigations (see Chapter 5), none of the publications specifically address the natural sedimentation processes that are interposed among the massive cultural deposits. Permission to conduct intrusive research in the cave is currently limited to Božidar Čečuk of the Croatian Academy of Sciences. However, a visual survey of the exposed archaeological stratigraphy in the cave reveals a few points of interest. Numerous horizons can be identified as pedogenic in nature, rather that anthropogenic. These can be seen as horizons of cobbles and other natural alluvium such as small stones and pebbles that are mixed with soils of various types. Some of these horizons extend completely across the excavated sections, indicating that the cave was not continually occupied, and that natural forces have acted independently upon the archaeological record.

At some point in the past, a small section of the roof near the entrance of Vela spilja collapsed, although it is difficult to isolate this event in the currently exposed stratigraphy. It is also clear that there are not any materials on the current cave floor that correspond to the collapsed section. In any case, many of the visible natural horizons in the stratigraphy contain at least 20-40 cm of deposit, with superimposed hearths both above and below the pedogenic horizons. Due to the fact that the cave

entrance is rather large and that it is geographically situated on a slope, it would seem logical that large amounts of natural sediments could easily enter the cave. Similar processes with telltale cultural materials such as hearths stratigraphically interposed with humus horizons have been recorded during excavations on the island of Hvar, in Grapčeva spilja, situated less than 30 kilometers north of Korčula, (Novak 1955a; and Tim Kaiser: pers. com.).

3.6.2 Jakasova spilja: Sedimentation Overview

Jakasova spilja (see fig. 7) appears to be in a rather different geological situation. The cave appears to be in the advanced stages of fossilization. Specifically, there appear to be very slow geologic and speleologic processes acting on this cave. These are evidenced by only a few stalagmites and stalactites found throughout the cave that would indicate water seepage into the cavern.

Another indicator of the slow sedimentation processes in this cave can be seen in the archaeological evidence. Late Neolithic Hvar Culture pottery found on the surface of the cave's floor contains 1-4 millimeters of calcareous encrustation on the top of the exposed fragments, but almost no pedogenic sedimentation is visible. Hence, the calcareous materials are being deposited at a significantly slower rate. The cave is considerably more isolated than Vela spilja and even though there are soil deposits just inside the cave's small entrance (70 cm. X 1.5 m.), it is likely that pedogenic materials are not frequently deposited into the main part of the cave in any large quantities.

3.6.3 Spilja u istruškom Dolcu: Sedimentation Overview

This cave site was relocated during the Summer 1996 season. The remote cave has been known to a few villagers from Smokvica and Čara. There were even intentions to build a shelter in the cave during the recent regional conflicts. However, the need to build such a structure in the cave did not arise, so the plans were abandoned. Older villagers were asked about the location of the cave and one woman volunteered to help cut a path to the entrance.

The cave has an entrance measuring ca. 3 meters in height, while the length of the chamber extends a mere 14 meters into the limestone (see figs. 7-9). The profile of the sedimentation in the cave was made from one of the two soundings conducted in the cave. Unit "S1" proved to have the best sub-surface integrity for sedimentation profiles, so this one was chosen for the final stratigraphical plans (figs. 10-11).

As can be seen on the sedimentation profile, numerous pedological horizons are visible with only three positive cultural loci (locus 008 and 016-017). While both 016 and 017 revealed only one lithic fragment (see fig. 49), both loci were associated with well

preserved charcoal remains which would suggest that a more thorough investigation is needed in the future. Locus 008 contained pottery fragments very similar to those modern wares documented by potters on the island of Iž (see Carlton 1988: 101-123), which would make the sherds fairly recent. However, they could have associations to Iron Age Este wares (Este III?) known from Italy, or possibly ribbed Liburnian wares from the East Adriatic (e.g. Batović 1987: 372 and T. XXXVI # 9). Unfortunately, it was not possible to determine whether the sherds had been wheel spun or not and hence, the discrepancy with provenance.

Of particular note regarding this profile is the fact that the modern sedimentation is not that deep above the travertine (stalagmitic crust) or bedrock. It is clear that there could be materials below a travertine, but time and resources did not permit this avenue of investigation. Likewise, the depth of the pedogenic horizons should be noted. The entire deposit in "S1" is just over 15 centimeters in depth. Either the events visible in the profile were quite brief or the sedimentation process in the cave is condensed. The cave is open to some natural elements, as leaves were found at the back of the cave, so it is not exactly clear why the sedimentation should be so shallow. In any case, each consecutive pedogenic deposit in the profile is clearly distinguishable from the previous. On a final note, it was relatively difficult to assess the effects bat guano might have had on the sedimentation. Although a few bats were present in the cave, there appeared to be little evidence for past extensive guano deposit, as seen in the profile.

The sedimentation observations conducted in these three caves are by no means conclusive. However, it is important to note that comparatively, subtle pedogenic and speleologic differences among the three caves do clearly exist. Since each site has cultural materials associated with these respective deposits, continued studies of this type will be vital for a better understanding of the nature of the archaeological record on Korčula.

Chapter Four

The Palaeo-Environment and Associations with the Archaeological Record

4.0 Palaeo-Environmental Data Concerning Korčula

Along the Dalmatian seaboard, extensive postglacial vegetational changes due to climate are not readily seen in the pollen records (Beug 1961a, 1962, 1967, 1982). Likewise, it has been archaeologically noted that only limited information is available which specifically concerns the vegetational histories of the immediate Dalmatian Coast and islands (Della Casa 1995: 3) and not much more concerning other parts of entire Adriatic Basin (Beug 1967: 271). There have been no core studies conducted on Korčula related to palaeo-environmental research and therefore no pollen diagrams exist. This fact makes it difficult to examine the island's specific floral history and development through postglacial times. In any case, it is fortunate that Holocene floral information has been gathered from other localities on the Dalmatian Coast (see fig. 12). Clearly, three of these are fairly close to Korčula and permit more reliable connections to be made. It is also possible to investigate certain references mentioned in antiquity concerning the island and Dalmatian landscapes. Naturally, these latter references must not be taken at face value, but certain references to specific flora and landscape conditions can be found in many of the descriptions. In later times, the aforementioned *Korčulanski Statut* associated with the Medieval and Venetian periods has pertinent details of the landscape, agricultural pursuits, and anthropogenic activities on Korčula. It should be mentioned that some very recent environmental studies have been done on the Dalmatian Coast focused on the impact of "expected" climatic change in the region (Randić et al. 1996, Barić et al. 1996). While these articles are important to East Adriatic environmental studies, the focus of this chapter is on those studies concerned with past environments and the effects on the archaeological record.

4.1 Pollen Samples from the Dalmatian Island of Mjlet

Holocene vegetational data can be applied to Korčula via the pollen studies conducted on the nearby island of Mjlet (Beug 1961a, 1962, and 1967). Mjlet is situated just over 8 nm. (15 km.) distant from the southeastern tip of Korčula. The map of South Dalmatia reveals the proximity of Mjlet to Korčula and shows the general location on the island where the core samples were taken for the study (fig. 13).

Regional vegetational studies have demonstrated that both Korčula and Mjlet are well established within the same zone of standard Mediterranean evergreen

vegetation which runs exclusively along the Dalmatian Coast (Horvat 1954: 434-447, and Bertović 1963: 231-234) (fig. 14). The specific evergreen forest zone on the Dalmatian Coast that Korčula and Mjlet fall into is dominated by *Quercus ilex* (Holly Oak) and in certain localities, *Pinus nigra* ssp. *dalmatica* (Dalmatian Pine). Both of these forest types also belong to the phytosociological order known as *Quercetalia ilicis*, as indicated by Horvat (1954), Bertović (1963) and Beug (1961: 604, 1967: 272). Beug (1967: 275) has produced a simplified version of these zones along the Dalmatian Coast.

The Horvat (1954) map of these vegetation zones on the Dalmatian islands seems to have some areas of the *Pinus nigra* ssp. *dalmatica* placed incorrectly. Reasons for this are not clear. Known (long-standing) localities on Korčula with *Pinus nigra* ssp. *dalmatica* have been either over-simplified or omitted by Horvat. Nevertheless, the vegetational zone in general is stated as *Quercetalia ilicis*, in which *Pinus nigra* ssp. *dalmatica* falls, so these omissions do not affect the present study.

Regionally, both islands are also well within a typical Mediterranean climatic zone with characteristic summer droughts, winter rains of cyclonic origin, and mean annual temperature of 15° ± 5° C (Roberts 1989: 137). In summary then, the islands of Mjlet and Korčula are both in the same climatic zone and in the same micro-vegetational zone found along the South Dalmatian coast. These connections allow direct inferences to be made regarding Korčula's palaeo-environmental flora.

4.2 Mjlet and the Malo Jezero Pollen Study Site

The cores for the pollen study were taken from a small bay known as Malo Jezero (literally translated as the "little lake") near the northwest end of the island of Mjlet. The Malo Jezero bay is ca. 400 meters in diameter and has a depth of no more than 30 meters. The small bay was once a fresh water lake that has been inundated with sea water. As will be discussed later, the lake sediments from these cores also indicate that this flooding did not occur before 2000 B.P.

The bottom of the core samples revealed a basal peat layer. This was covered by the lake sedimentation as well as numerous strata of pollen deposit. Due to the presence of the peat, the lake has been identified as an older doline. As mentioned in the previous chapter, doline formations in the karst are common along the entire eastern Adriatic seaboard, from Slovenia down to the southern islands and coast.

The initial study of the core samples revealed that Malo Jezero first developed a flat sedge bog on the bottom of the doline and later filled with fresh water. The sediments found in the core consisted of calcareous, clayey, and varved gyttjas [5] (Beug

[5] A gyttja can be described as a rapidly accumulated organic muddy deposit, normally found in eutrophic, or nutrient rich, lakes.

1967: 272). Korčula has a few areas that are probable sediment filled dolines, such as sections of the previously discussed Blatsko polje, Sitnica polje near Potirna, or the Krušev dol near the village of Pupnat. As research on Korčula's Stiniva Bay samples has shown (Chapter 11) these areas on Korčula could prove ideal for similar core studies.

4.3 Vegetation and Climate Reflected in the Malo Jezero Cores

Four Postglacial forest periods are reflected in the Malo Jezero pollen diagrams. These can be seen to reflect directly on the region of southern Dalmatia that falls into the aforementioned *Quercetalia ilicis* zone of vegetation. A simplified figure has been designed that corresponds with the pollen diagrams from Malo Jezero and should be consulted when reading the following text explanations (fig. 15). The radiocarbon dates are positioned relative to their correlation with the core data. The original pollen diagrams are found throughout numerous Beug references (1961a: 612, 614, 616, 618, and 1967: 274-275).

The following four forest periods identified in the Malo Jezero cores and detailed by Beug are:

1. **Period A**: This period was found to have a predominance of deciduous oak forests (recognized as *Σ Quercus*). This correlated to a time span from 9000 B.P (when the sedimentation began) to 7600 B.P.
2. **Period B**: This period showed a dominance of pollen from *Juniperus* and *Phillyrea* in the samples. This also coincided with the beginning of standard Mediterranean climatic conditions in the region. The time span is from 7600 B.P. to 6300 B.P.
3. **Period C**: This period, as revealed in the cores, showed a dominance of the evergreen *Quercus ilex*. These sediments date from 6300 B.P to 2200 B.P.
4. **Period D**: This point is seen as the *Pinus-Quercus ilex* period. However, sediments from the last 1900 to 2000 years are lacking in this sample. Beug states that this could have been due to erosion on the lake bottom. Thus, the surface of the deposits (top of the core samples) do not represent a synchronous horizon and is not accounted for in the cores (Beug 1967: 276)

4.3.1 Period A

Period A has been called the deciduous oak forest phase. The pollen ranges from the combined information from the Malo Jezero cores show that there was a predominance of deciduous trees. Besides *Σ Quercus, Corylus* (hazels), *Ulmus* (elms), and *Tilia* (limes) are present with higher pollen values (as a percentage of the entire pollen count) than the later B, C, and D periods. Deciduous to evergreen tree pollen ratios are shown at 6.3/ 1. The dominance of the deciduous pollens reflects a middle-European type of climate, but the presence of evergreens in the sample, such as *Fraxinus ornus* (manna ash), and *Ostrya* (European hop hornbeam) show that an element of sub-mediterranean vegetation was present.

The deciduous oak period can also be divided into two sub-periods based on the *Pinus* (pine) values found in the cores (Beug 1967: 273-275), and dated by various ^{14}C samples.

>Non-pollen bearing clay humus from the bottom of the doline (pre-A-1) was ^{14}C dated and gave the basal date of 9000 B.P., uncalibrated (Beug 1961: 620, 1967: 276)[6] .

1. **Period A-1** shows that the pine pollen values found in the cores were up to 20% of the overall pollen sample.

Note>>A layer of volcanic ash was found at the top end of the Period A section of the core. The source of this material is unknown, but perhaps this can be used in the future for relative dating purposes.

Note>Sedge peat was ^{14}C dated at this point in the section that produced a date of ca. 8420 B.P., uncalibrated.

2. **Period A-2** (and into Period B) was found to have a rapidly decreasing *Pinus* pollen amount. Beug suggests that this might be due to an older, *Pinus*-dominated forest that is seen in rapid decline in the Postglacial pollen record (1967: 273). Perhaps this is the end of a late Postglacial transition from a *Pinus* dominated forest to a Σ *Quercus* type.

4.3.2 Period B

The Period B is dominated by a higher presence of *Juniperus* and *Phillyrea* pollen. These evergreen species, more resilient to drought and hot, dry summers, are more predominant during this period.

1. **Period B-1** has a distinctive decrease in the ratio of deciduous oak to evergreen forests. From the 6.3/ 1 ratio found in Period A, there is a drop to 1.5/ 1 for Period B.

However, Beug states that it is rather difficult to determine the general character of the vegetation during Period B due to the fact that there are no modern plant communities with a dominance of *Juniperus* or *Phillyrea*. This could have been a climax vegetation, lacking the abundance of *Quercus ilex* in the present standard mediterranean vegetation (1967: 273, 274). However, amounts of *Quercus ilex* pollen were detected at the end of Period A-2, increasing into Period B-1, and rising sharply into B-2.

2. **Period B-2** shows a marked increase in the *Quercus ilex* pollens. This is at first seen as a gradual trend through B-1 (ca. 10%), but by the end of B-2, the percentage appears to be ca. 60%. *Phillyrea* shows a decrease in pollen percentages towards the end

of B-2, as does *Juniperus*. The end of Period B-2 also begins to show an increase in *Pistacia* pollens.

Note: >Another ^{14}C sample at this point in the core sections dates to 6840 B.P. ± 125 yr. (uncalibrated).

4.3.3 Period C

This period shows a dominance of *Σ Quercus*, with high *Quercus ilex* percentages. The period has been divided into three sub-periods.

1. **Period C-1** shows *Juniperus* values as high but rapidly decreasing and *Erica* (heather) pollen as evident and increasing.

2. **Period C-2:** The *Pistacia* pollens shows a slight increase towards the end of C-2, and finally, *Pinus* pollen percentages begin to slowly rise.

A pronounced subdominance of *Erica* also appears in C-2 It has been suggested that this garrague plant, as well as the macchia, are culturally controlled (Rackham 1982: 177-198) and appears only after the human introduced macchia evergreen shrub is grazed or burned away (Beug 1967: 276), and hence implies that *Erica* growth would be controlled the human factors. However, the Malo Jezero pollen samples show the *Erica* as present *before* (author's emphasis) the macchia, suggesting a non-anthropogenic (e.g. natural) origin. Beug has no explanation for this phenomenon, although the fact should not be ruled out of a naturally occurring *Erica*. As of yet, there is no archaeological evidence from this period to support a scheme of deforestation, macchia encroachment, and later grazing or burning that would anthropogenically assist the *Erica* growth.

It has also been suggested that the ever-present evergreen macchia could evolve into full woodland if there were not cultural factors in effect to check this scrub's growth (Roberts 1989: 139-140, Rackham 177-198). Furthermore, general patterns throughout the Mediterranean (and seen in the Malo Jezero cores) do indicate that evergreens have come to dominate the landscape, while the sub-humid forests have gone into rapid decline. However, whether this is due to human impact on the landscape, natural climatic change or a combination of these factors is still debated (see Beug 1961, 1962, and Roberts 1989: 140-141).

3. **Period C-3** shows the clear, steady, and rapid rise of the pine pollen percentages found in the core. Likewise, *Castanea* (chestnut) appears in the pollen record, as do *Juglans* (walnut) and *Secale* (rye). Increases in the *Pistacia, Juniperus,* and *Olea* (olive) pollens are visible. Beug indicates that this sub-period probably

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[6] ^{14}C samples were all conducted by Prof. Dr. Münnich in the Heidelberg ^{14}C laboratory. Unfortunately, no other information was given regarding sample numbers or technique, and for the 9000 B.P. and 8420 B.P. dates, there are no +/- values given.

corresponds with known Greek colonization in the Adriatic, ca. 500-200 B.C. (1967: 276-277). This period is later defined by Brande as the *Siedlungszeit,* or settlement period (1973).

Beug claims that these increasing values, along with the appearance of *Castanea, Juglans,* and *Secale* are attributed to human activity. Beug states that the higher percentages of *Pistacia* and *Juniperus* in the pollen count reflect the fact that the evergreen *Q. ilex* forest was cut down in some areas and replaced or taken over by the evergreen macchia shrub. Given the present lack of understanding concerning pre-Illyrian agriculture, it is perhaps a bit idealistic and premature to suggest that the eastern Adriatic islands (specifically) were under such intensive agricultural activities in pre-Greek/Roman times. However, a similar situation with evergreen macchia replacing the cut forests was later detected in a pollen study from the northern Adriatic coastal area of Istria (see figure 13 this text and Beug 1977: 357-381).

The *Pinus* pollen values that increased in percentages towards the end of C-3 have been claimed to be from introduced pines, perhaps from *Pinus halepensis.* Beug states that the *P. halepensis* is definitely not native to Dalmatia (1967: 277), and since this species is the pine from which Greek *retsina* wine is derived, perhaps there are south Balkan origins. This generally couples well with the first solid archaeological evidence for Greek colonization along the eastern Adriatic seaboard.

4.3.4 Period D

Period D is identified as the *Pinus-Quercus ilex* period in the Beug pollen diagrams. Pine pollen percentages are as high as *Quercus.* It is this thriving vegetation period that probably produced the dark pine forests from which Korčula is named. Roman occupations are probably not represented in the cores, because, as Beug states, higher values of cultural plant pollen would then be detected in the cores (1967: 277). It is at this point that the pollen record terminated in the Malo Jezero cores.

4.4 Other Vegetational Records from the Dalmatian Coast

As stated in earlier in this chapter, there have been a few other studies that can yield some information possibly relating to the Postglacial vegetation on Korčula. Unfortunately, Malo Jezero is the only study that has been conducted exclusively within the *Quercetalia ilicis* micro-vegetational zone. However, the Postglacial pollen studies conducted in the nearby Neretva Lowlands (Brande 1973: 1-44) can yield some valuable information, as well as the studies from the North Dalmatian Coast area known as Istria (Beug 1977: 357-381) (see figs. 12-13).

4.5 The Neretva Lowlands Samples

The Neretva River empties into the Adriatic Sea just north of the Pelješac Peninsula (fig. 13) and since this locality is quite close to Korčula, certain samples should reveal further Postglacial vegetational information. Only two localities out of the six that were tested in the Neretva-Lowlands were situated in the phytosociological order of *Quercetalia ilicis*. Furthermore, these two localities are themselves on the geographical threshold of another two vegetational zones. One zone is the phytosociological order *Quercetalia pubescentis*, with a more sub-Mediterranean, deciduous oak-type forest than the predominately evergreen *Quercetalia ilicis*. The other nearby vegetational area is the actual Neretva Lowlands, or Neretva river valley basin, which is documented by Bertović (1963) and illustrated by Brande as a brackish, freshwater marsh area (1973: 3). Although this latter area is not a phytosociological zone in itself, the area probably displays seasonal attributes of mild wetlands in the winter with an abundance of water in the summer. Hence, these wetlands might support certain types of vegetation which are not found in the *Quercetalia pubescentis* or *Quercetalia ilicis*. The fact that the Neretva Valley study area is identified with diverging vegetational zones (Brande 1973: 4) along with brackish lowlands will obviously affect direct comparisons with Korčula's postglacial vegetational history. However, due to the complete lack of other pollen sample studies nearby which could serve as alternate comparisons, the Neretva Lowlands samples must be examined. So, although the location of the sample area is fairly close to Korčula, the data should not be stretched past its useful limits.

The two localities in the Neretva Valley closest to the coast (and Korčula) and on the edge of the *Quercetalia ilicis* zone are identified as Peraško Blato and Lovorje. Unfortunately, the samples at Peraško Blato and Lovorje were conducted with less-than-ideal sub-surface boring situations and obstacles identified by Brande (1973: 16, 19), but the materials were nevertheless collected in a controlled manner. A point of minor importance concerning the study was the fact that Brande did not publish the accompanying pollen diagrams from the cores. Therefore, consultation and review of the original data was rather problematic and did not permit direct profile comparisons with the diagrams from the Malo Jezero study. In any case, the Brande text is extensive and histograms were included that display pollen percentages and describe general comparisons to the Mjlet data.

4.5.1 Peraško Blato Samples

The samples from Peraško Blato only go as far back as the B-2 period identified by Beug on Malo Jezero and only reliably yield data starting from the B-2/ C-1 interface,

upwards. However, the Peraško Blato cores do more or less mirror the C-1 through D pollen records that were identified in the Malo Jezero cores. In brief, the pre-Roman Postglacial pollen record from the coastal area of the Neretva Lowlands is basically quite similar to Mjlet, and hence Korčula. This could be expected given the general proximity of these three localities to each other and the fact that they are in the same micro-forest zone.

Perhaps of particular interest is the evidence that was collected in the Peraško Blato samples after Beug's "D" period. It has already been explained that some sort of lake bottom anomaly at Malo Jezero excluded the last 2400 years of pollen evidence from the core sample (sections 3.2, 3.3.4, and Beug 1967: 276). Fortunately, this was not the case at Peraško Blato, so it is now possible to view certain post-2400 B.P. (e.g. Greek and Roman colonization periods) pollen evidence from the *Quercetalia ilicis* region.

Brande has identified a *Siedlungszeit*, or settlement period, from the pollen evidence but does not really discuss this in detail, at least with implications from an archaeological perspective. This settlement period would generally be interpreted as beginning in the early 6th century B.C. with the first records of a Greek (e.g. foreign) colony in the Adriatic. Coincidentally, this colony is the alleged Cnidian settlement on Korčula (see section 2.1, and Strabo 7.5.10). But, it is only towards the early 4th century B.C. that there is strong literary evidence (Diod. 15.13. 4-15, 14.2) and supportive archaeological evidence (e.g. Gaffney et al. 1991: 59-77, Kirigin 1990: 291-321, Kirigin 1991: 5-41, Zaniniović 1980: 91-95, Chapman et al. 1988:145-199) that there were active settlements of Greeks and Romans in the eastern Adriatic.

The implications are, naturally, that this *Siedlungszeit* which brought the foreign plants, trees, and specifically, pollens, can be detected in the core samples. This would reflect on the settlement period, which brought these foreign plants, new pollens, and a probable modification of the landscape to support a different culture and their imported vegetation.

For the Peraško Blato samples, Brande has briefly described three vegetational periods, all dating from Beug's "D" period (Brande 1973: 21) and later. In the so-called $3a_1$ period (ca. 2100 B.P., uncalibrated), pollen percentages from the "older colonial settlement period, Part 1" (*ältere Siedlungszeit, 1. Teil*) (op cit.: 18) show nothing of interest except for a minimal value of *Juniperus* (4%). But, $3a_2$ (pp. 18) shows that the *Juniperus* curve climbed to 16%, *Pistacia* and *Myrtus* are described as about the same percentages as *Juniperus*, and perhaps more importantly, *Castanea* (chestnut) and *Secale* (rye) pollens appear in the pollen percentages.

Beug's pollen diagrams have these pollens first appearing early in C-3 on Mjlet (1967: 273-275), which would tend to date this settlement period a few hundred years

earlier than the Peraško Blato pollens indicate. This fact is also pointed out by Brande (1973: 22). Specifically, Brande states that Beug tends to put the introduction of the foreign plants into the Greek colonial period, while Brande's Neretva Lowland evidence suggests the pollen arriving in the later Roman colonial period. This could reflect the slower spread of imported plant species from the islands and immediate coastal areas (where first Greek and Roman colonial contact was obviously made) to the lowlands leading down to the coast.

However, it is known that the Greeks, although colonized on the nearby island of Hvar ca. by 384 B.C., did not have control of the entire landscape at all. In fact, the colony area was quite small and the native population was still living in and near the colony and probably controlled most of the landscape (Diod. 15.13. 4-15, 14.2). Likewise, the Greek *Psephisma* (inscription) found in the Lumbarda area of Korčula indicates specific land allotments given out to Greek colonists, but in areas still controlled by local Illyrian inhabitants (see Rendić-Miočević 1965: 77-81, Lombardo 1993: 161-188, and Cahill 1993: 345-346). So, there is evidence to support Beug's claim of Greek introduction of foreign plants, albeit with a possible sluggish spread of the imported crops. It is clear that this probably would not have left a few hundred years gap for those imported species to get from the islands to adjacent areas near the coast (a mere 5-10 km. distant). The pollen cores do suggest an earlier presence of imported plants on the islands as compared to their later arrival on the mainland.

Naturally, evidence of this nature is by no means conclusive. The discrepancies between Malo Jezero and the Neretva Lowlands pollen diagrams could stem from sampling and related data recovery inconsistencies. However, both Malo Jezero and Pereško Blato pollen evidence do place the appearance of foreign plant pollens in the 2600-2100 B.P. range, which generally dovetails with the known Greek and Roman colonization periods. Unfortunately, fine tuning the resolution of the investigation is not currently possible.

Rather interesting information from the later period 3b. at Pereško Blato (ca. 500 A.D.) is the significant decrease in the *Olea* (olive) pollens, perhaps reflecting the exit of a Greek/Roman-type culture and vegetation from the area. The end of the Roman period was detected in the pollen diagrams from Istria and dated to ca. 500 A.D., so there ample reason to suggest this could be the case could also be reflected in the Peraško Blato pollen record. Post Roman immigration to the region by other groups, mostly Slavs (ca. 500-800 A.D.) did not seem to have an affect on the regional vegetation, as seen from the pollen diagrams (Beug 1977).

4.5.2 The Lovorje Samples

Period $3a_1$ shows a negligible pollen percentage for *Juniperus,* but has *Olea* (olive) at 4%. In Period $3a_2$, *Juniperus* climbed to 14%, *Juglans* climbed 2%, and *Quercus ilex* is reported at 48% of the $3a_2$ pollen sample. It is suggested that at this point that the *Juglans* and *Castanea* were probably introduced. The deciduous oak forests of the *Quercetalia pubescentis* were cut down to allow for vineyards, *Olea,* and *Juglans* orchards. *Šibljak,* an evergreen garrague-type shrub predominately comprised of *Juniperus,* was planted. The evergreen macchia would have probably spread at this time as well (Brande 1973: 20).

With the exit of the Romans from the region, Period 3b, identified as the Medieval period, was found to have a regeneration of the forests until roughly the 13th century A.D.. This would correspond well with the extensive Venetian de-forestations in the immediate area, mainly for lumber (Batović and Chapman 1985: 158, Jedlowski 1975). On Korčula, the Venetian deforestations are also supported by the *Korčulanski Statut,* which details lumber trade and related activities on Korčula beginning from the 13th century A.D. (Jeličić 1995).

4.5.3 Neretva Lowlands Postglacial Pollen Study: Summary

The Neretva Lowlands samples most relevant to the study of Korčula's vegetational history are the Peraško Blato and Lovorje localities from the edge of the *Quercetalia ilicis* region. The samples date with reasonable reliability to the start of the postglacial Atlantic Period and can be seen to correspond to Beug's Malo Jezero study as the B-1/ B-2 periods. Evergreen oaks, with most speciated in the pollen record as *Quercus ilex,* dominated the coastal forests (identified by Beug as the C-1, C-2, and C-3 forest periods) at that time.

Finally, the pollen evidence implicates Roman and possibly earlier Greek colonization activities which would have introduced, among other plant types, *Juglans* (walnut), *Castanea* (chestnut), and *Olea* (olive), and large scale deforestation. This facilitated the rapid spread of the already present evergreen *Juniperus,* seen in the pollen record probably as a garrague-type scrub brush, and the evergreen macchia scrub. Once again, this data is received with minimal conflict when compared to the general pollen diagrams from Malo Jezero on Mjlet. Post-Roman forest regeneration was visible from the overall Neretva Lowland samples, and the later Venetian forest destruction was also apparent in the pollen record.

4.6 Data from the Northeast Adriatic Coast: The Istrian Peninsula

The Istrian Peninsula is situated along the northernmost section of the eastern Adriatic Coast. The main study area examined by Beug (1977: 357-381) is situated by Lake Palu, which is located near the coast and ca. 10 kilometers south of Rovinj (see fig. 12). The actual site of the pollen samples is situated roughly 320 kilometers north of Korčula, so it is apparent that this sample area can only be used for a very general comparative analysis regarding Korčula's postglacial vegetational development. Nevertheless, as was found in the Neretva Lowland research, certain data can be applied to Korčula.

The pollen in the samples dates from the 5th millennium B.P. and ends with the fairly recent pollen deposition. The only zones of *Quercus ilex* on the Istrian Peninsula identified by Beug were found to be along the immediate coast, in a band measuring no more than 30 meters in width. The rest of the Istrian Peninsula was found to be a deciduous sub-mediterranean oak. Beug points out that the small band of *Quercus ilex* found along the coast is probably the only native vegetation not influenced by any anthropogenic factors (1977: 351, 378-379).

Once again, as was shown in the Malo Jezero and Neretva Lowlands studies, the Roman colonization period can be dated by the appearance and steady rise of the *Juglans* and *Castanea* pollen curves in the samples. Coupled with *Olea* and other known pollens indicating farming activities (e.g. *Fagus*), there was an increase in mediterranean evergreen plant pollens, such as *Phillyrea*.

Forest clearances, visible in the tapering off and eventual decline of deciduous oak pollens, allowed for the expansion of the Roman farming activities. This clearance activity had more than likely ushered in the evergreens which rapidly replaced the deciduous oak areas. The evergreens would then be found in areas where they might not have gone if the anthropogenic clearance factor was not in effect. Beug also suggests that the evergreens were probably in the form of a macchia, rather than a standing and slower developing evergreen forest. Pollen evidence suggests a macchia of a *Quercus ilex* and *Phillyrea* type (op. cit.: 351, 376, 379).

This couples well with the known pattern of evergreen growth throughout the Mediterranean, specifically in areas of forest destruction and other heavy anthropomorphic activities. The widespread and well documented "arboriculture" promoted vast clearances in many areas throughout the Mediterranean basin which, as has been seen along the Dalmatian Coast and Istria, was followed rather rapidly by evergreen growth into areas where the type had been absent or rare (Roberts 1989: 141). As Roberts indicates, arboriculture was a prominent anthropogenic factor in the clearances phase (3500 to ca. 1500 yr. B.P.) recorded in the pollen diagrams from Sögüt,

Turkey (*op. cit.*: 140-141). The pollen diagrams display forest regeneration after the main arboriculture period, but the growth came back mainly as evergreen *Pinus* and cereals, probably *Secale* (*op. cit.*: 140-141; and van Zeist et al. 1975: 53-143).

The pollen evidence from Istria shows that from post-Roman times, ca. 500 B.C. to the early Middle Ages, there was no increase in pollen indicators demonstrating further human activity. General historical accounts support the theory that foreigner influence on the local agriculture during these times was minimal (Beug 1977, Brande 1973).

Finally, pollen records suggest that during the late Middle Ages, specifically when the Venetian domination of most of the eastern Adriatic seaboard occurred, the *Juniperus* appeared to be even more prominent. This has been explained as the possible result of extensive grazing, coupled with deforestation, and was shortly followed by the *Phillyrea* macchia. Beug states that the current evergreen macchia band is situated along the coast, approximately 200 meters wide, in the previous zone of evergreen growth (1977: 357).

4.7 Summary: Postglacial Vegetational History

From 9000 to ca. 7600 B.P., the *Σ Quercus* and later *Juniperus-Phillyrea* forests (periods A and B) were dominant. These were deciduous, sub-Mediterranean type forests, so climatic conditions during that time were colder in the winters or more humid in the summers than present conditions. A partial percentage of Mediterranean evergreens was evident on the Dalmatian coast during this period. However, there is no evidence for vegetational migrations to the region or climatic changes that would affect vegetation.

By ca. 7600 B.P., seen as the B-1 and B-2 transition, climatic conditions probably shifted, as the deciduous forests began to decline along the Dalmatian coast and were being replaced by a *Quercus ilex* (Holly Oak) dominated forest. The end of period B, ca. 6300 B.P., must have ushered in some sort of mild climatic changes, as the deciduous sub-Mediterranean forests on the Dalmatian coast were soon dominated by the current Mediterranean type, primarily consisting of the evergreen *Q. ilex*. The climatic characteristics now consisted of warmer summers and milder winters (period C).

However, from 6300 B.P. until ca. 2200 B.P., the *Quercus ilex* was the dominating vegetation on the Dalmatian coast and the only evidence for the type's decline in the pollen record is the extensive anthropogenic destruction of the natural *Q. ilex* forests. There are no climatic factors apparent in the pollen record that suggest *Q. ilex* evergreen forest change. Even in the immediate coastal hinterlands, there is no pollen evidence post-7000 B.P. to suggest that climate affected the sub-mediterranean

vegetation types (Brande 1973: 1-44). Once again, it appears that the evergreen oak forest was only disturbed after ca. 2200 B.P. by massive human efforts at deforestation, and this seems to be the only factor that has changed the stable *Quercus ilex* vegetation on the Dalmatian coast that lasted the previous 5000 years (Beug 1982: 99).

4.8 Post-Glacial Environmental Data and the Archaeological Record

It is fairly clear that the Eastern Adriatic pollen records indicating early human agricultural activities are almost non-existent. Beug's research (1961a, 1962, 1967, and 1977) places the first evidence of human impact on the native vegetation of the Dalmatian islands during the Greek contact period. Brande's research places the initial and intensive anthropogenic vegetational changes in the Roman colonization period. In both cases, as has been mentioned in the discussions in this chapter and represented in the core samples, the pivotal point of anthropogenically based vegetational change is placed well into the Late Iron Age.

Intensive pollen and charcoal sedimentation analysis conducted as far north as Finland (Sarmaja-Korjonen 1992: 1-75) have shown that pollen records of early vegetational clearances for agricultural purposes are rather weak and definitely fragmentary. Furthermore, the same study noted that it is not until the intensive agricultural activities of the local Iron Age that this evidence appears in the pollen record with confidence. This same situation, discussed in detail earlier in this chapter, is certainly reflected in the known pollen evidence from the Dalmatian coast.

All of the pollen diagrams examined on the Dalmatian coast reflect a fairly acute change of tree pollen percentages in the Late Iron Age, obviously indicating the deforestations. There is no evidence for earlier activities of this nature, although this should not negate the possibility of pre-Greek landscape clearances.

Interesting parallels can be seen in the pollen diagrams derived from sediments in the lake of Mörtträsk, situated on the south coast of Finland (Sarmaja-Korjonen 1992), and the Beug pollen diagrams from Malo Jezero. Both show that *Secale* (rye) only creeps into the pollen diagrams just prior to the periods of forest clearance (Beug 1967: 274-275 and Sarmaja-Korjonen 1992: 27). Perhaps this marks the early arrival of a grain crop before the cultural need for extensive clearances to cultivate. *Secale* has been described as the most dispersed Ceralia-type pollen. Yet, prior to Roman times, the spread was sparse and *Secale* was probably found in the pollen record only as a contaminate weed found in wheat or barely (Huntely and Birks 1983: 470, 471). Likewise, *Juniperus* pollen percentages begin to rise at about the same time as *Secale.* Interpretations of the pollen record have suggested that *Juniperus* seems to flourish after extensive deforestations or grazing (e.g. Beug 1961a, 1967, 1977 and Huttunen

1980). Nothing more can really be said in comparison due to the lack of extensive archaeological evidence to support any claims, but perhaps pan-European comparative examples can serve as a starting point for future investigations into vegetational histories.

It has been pointed out that only slight variations in tree pollen percentages are found during the earlier phases of vegetational clearance and that only traces of anthropogenic pollens, if any, are found in correspondence (Sarmaja-Korjonen 1992: 2). Furthermore, early anthropogenic pollens have been recorded long distances from their locality of origin (ibid.). Their presence would naturally indicate at least regional agriculture and clearance, which can be supportive in regional archaeological investigations. However, local implications cannot be inferred from these meager traces. The pitfall of attempting to push scant pollen traces into the archaeological discussion and "...trying to make something out of nothing..." should obviously be avoided (ibid., and Vuorela 1986: 53).

It is not surprising then that none of the pollen diagrams from the Dalmatian coast specifically reflect any trace of earlier Neolithic agricultural activities. It is very clear from archaeological investigations that farming and/ or some form of agriculture was in operation by at least 5900 (cal. BP) in and around the Adriatic Basin (e.g. Chapman and Müller 1990, Karg and Müller 1990). Beug identified a *Getreide-Typ*, or cereal grain-type pollen, in the early periods of the Malo Jezero cores (1961a: 612, 616). But, the pollen diagrams seem to indicate a percentage value of only ≤ 5%. This value tapers off over time and later only appears at a constant percentage of ca. ≤ 2%. Due to the negligible fluctuations of the pollen percentage observed over millennia (as seen in the cores), the diagrams are more than likely tracking a wild grain. Perhaps misinterpreted as possible domestics, these grains and "spontaneous graminids" have been ruled out as domestics in other intensive studies (see Huttunen 1980: 32, re: Beug 1961b and Andersen and Bertelsen 1972). In support of the minor percentage of generic cereal grain-type pollens displayed at Malo Jezero, core samples from the North Adriatic Gulf of Piran, near Istria, showed only a mere ≤0.5 % of cereal grain-type pollens in the early sections of the core with none found in the later sections (Beug 1977: 376).

More recent evidence from Bulgaria extends the complications of recognizing anthropogenic indicators in the pollen record. Wild species of *Triticum monococcum* (einkorn wheat) and *Secale* have been positively identified in the pollen record. This would naturally have implications on the pollen curve of *Ceralia*, especially in the Early Holocene (Huttunen et al. 1992: 77-78). There is no reason to doubt that these wild cereals could have been exploited. However, without further quantifiable floral evidence, it is not clear as to whether these crops were fully domesticated. Naturally,

this makes it extremely difficult to identify the first human influences or domestication of the vegetation as reflected in the pollen records (ibid.).

Further complications of pollen indicators concerning earlier (i.e. Neolithic) periods of agriculture arise if these activities were relatively short-lived or very localized. Likewise, slow pollen sedimentation might occur in the lakes from which core samples are taken. This would directly affect the ability to account for isolated and perhaps quick bursts of agricultural activity. As a result, early small-scale, short-term, cultivation or clearance periods can be blurred in the pollen records (Huttunen 1980: 31 and Sarmaja-Korjonen 1992: 2) if not completely undetected.

In conclusion, current studies suggest that early agriculture has no definite anthropogenic pollen indicators as seen in both Adriatic and regional pollen studies, although these activities were no doubt taking place in certain areas (see next section: early domesticated Ceralia evidence from archaeological contexts in the Adriatic Basin). Perhaps the lack of pollen evidence reflects a low intensity Neolithic agriculture that was based more on wild varieties and only in later times on various domesticated species. This is an aspect that cannot be overlooked along the Dalmatian coast and adjacent islands. The lack of pollen indicators might be due to the inability of these pollens to register in the specific loci that were tested. Finally, a combination of these factors and others unforeseen might contribute to a hazy pollen representation in the cores that might reflect early farming activities. Currently, there is not much firm archaeological evidence on the Dalmatian Coast to support any of these arguments.

4.9 Archaeo-Ethnobotanical Evidence from Dalmatia

Unfortunately, there is not too much evidence that has been collected specifically on the Dalmatian coast concerning the presence of domestic plants or cereals [7] in pre-Greek times. Many cave situations, such the well known Vela spilja on Korčula, seem to be ripe for potential archaeological recovery of preserved grains, but there has not been much focus on this avenue of research in the past. Naturally, the situation (archaeological, geological, etc.) must be such that the preservation and eventual recovery of this evidence is possible and unfortunately, this is not always the case. However, there are a few sites, specifically around the rim of the Adriatic Basin, where plant remains have been recovered in archaeological contexts and studied.

4.10 Archaeological Context Evidence

The study of cultivated plants, regarding their origins and spread, is centered on the synthesis of data from two specific sources. The first source is data gathered

[7] Cereals are defined as "any annual grasses cultivated for their grains"; Zohary and Hopf 1994: 15.

through the examination of plant remains recovered from archaeological excavations. The second source is primarily evidence gathered from living plants, with the focus on the wild ancestry these plants might have had in the region (Zohary and Hopf 1994: 1).

Throughout Dalmatia, early evidence of preserved cultivated plants is quite thin (see fig. 16) and artifacts associated specifically with domestic crop cultivation are not too common. It has recently been noted that there are only two Neolithic sites in Dalmatian which have been sampled well enough to show evidence of both domestic plants, domestic animals, associated ceramics, and polished stone (Chapman and Müller 1990: 132; Müller 1990). Evidence throughout the adjacent Balkan regions is not much better (see Zohary and Hopf 1994: 214). Therefore, the goals of this section are to review the regional locations of these finds, detail the type of evidence present, and assign calibrated dates (where appropriate). As will be discussed later in this thesis, many of these sites temporally correspond with cultural occupations on Korčula.

4.10.1 Evidence from Dalmatia

The most recent and perhaps most reliable archaeo-ethnobotanical evidence is from the Early Neolithic Tinj-Podlivade, ca. 25 kms. east of Zadar, and from the Middle Neolithic site of Pokrovnik, situated between the coastal towns of Šibenic and Split and adjacent to the Dalmatian coast (see fig. 16).

The Tinj-Podlivade site, with its diagnostic Early Neolithic Impresso pottery, was found to have remains of *Triticum monococcum* and *Triticum dicoccum* (Chapman and Müller 1990: 130; and Chapman et al. 1990: 32). Charcoal samples were taken from secure contexts, all within cultural strata associated with Impresso pottery. Uncalibrated dates (uncal. BP) for these samples are: 6980±160 BP, 6670±260 BP, and 6280±210 BP [8]. Calibrated dates from the site range from 6200-4700 cal. BC in the 95.4% confidence range (2σ), as recalculated for this thesis research using the more recent calibration curves (see figure 19). These dates have a definite connection to Korčula, as Impresso-Ware Neolithic evidence has been well documented in Vela spilja (see aforementioned Čečuk references).

The botanical evidence uncovered in one of six sample units excavated at the Pokrovnik I site (area VI/ C) revealed grains of the *Triticum dicoccum* (Emmer) and *Triticum monococcum* (Einkorn) wheat varieties (Karg and Müller 1990: 374, 377). One date obtained from the site associated with Early Neolithic Impresso wares but published without a lab number is listed as 7000±100 uncal. BC (Chapman and Müller 1990: 130; and figure 24). Radiocarbon testing established that the actual Pokrovnik

[8] All dates BP dates found in the appropriate texts were recalibrated using the Stuiver and Pierson calibration curves (1993).

grains themselves date to 6290±65 BP, or 5340-5060 cal. BC (Karg and Müller 1990: 377), while tests from grain finds carbonized in a Middle Neolithic cultural context at Pokrovnik were dated to 6300±150 BP, or 5500-4850 cal. BC (Srdoć et al. 1984: 449-460; and figure 20). The Danilo pottery from the Pokrovnik site shows the typical characteristics of the Middle Neolithic stratigraphies of Smilčić (Batović 1962: 31-116), but due to the "herring bone" or "fish bone" motif found on the pottery, the associated finds are dated to the earliest phase of the Middle Neolithic Danilo (Karg and Müller 1990: 376), referred to in some contexts as the Danilo A phase. Likewise, both the Early and Middle phases of Danilo Middle Neolithic have a temporal correlate (local Vela Luka Culture) at a cave site on Korčula [9] known as Vela spilja (cf. Čečuk 1980, 1989, 1992, and 1995: 5-33)[10] , while Middle and Late phases of the Middle Neolithic are known from Korčula's Jakasova spilja (KZ-013) (e.g. Čečuk 1980). Finally, the Danilo type-site, found along the Dalmatian coast and seen on the map as Danilo-Bitinj (figure 18), also revealed traces of *Triticum monococcum* and *Triticum dicoccum* (Hopf 1964: 107-108; Karg and Müller 1990: 378).

4.10.2 Evidence from East of the Dinaric Alps

Early Neolithic sites in the Bosnian hinterland, such as Obre I, with Starčevo (localized variant of the Early Neolithic) and Impresso pottery, and Kakanje, with Middle Neolithic Danilo pottery, have been found to contain evidence of these grains (Renfrew 1974: 47-53). The early Neolithic site at Lug (Hopf 1958: 97-103) has been found to contain evidence of *Triticum monococcum* and *Triticum dicoccum*. Likewise, the Early Neolithic site at Lisičići, situated at the head of the Neretva River Valley but closer to the Adriatic coast than the three previously mentioned sites, revealed traces of domestic Einkorn and Emmer wheat grains (Hopf 1958). Other Early Neolithic sites east of the Dinarics are known to have evidence of plant remains, such as the Starčevo type site found in Serbia, near Belgrade (see Renfrew 1979: 243-265). These sites are perhaps at the geographical limit regarding direct associations to Korčula but in any case show more or less the same grains present as in the Dalmatian and West Adriatic sites (for an overview, see Zohary and Hopf 1994: 214).

4.10.3 Evidence from West Adriatic Coastal Areas

Across the Adriatic on the Italian seaboard (fig. 16), Neolithic coastal sites such as Le Macchie (Early Neolithic with Impresso pottery) (Constantini 1981: 107-111), Redina II (Early Neolithic with Impresso pottery) (Follieri 1982: 337-344), and Passo di

[9] The local associate of the Danilo Culture on Korčula, in the later phases with painted pottery, is now identified by B. Čečuk as the Vela Luka Culture, with its stylistically different painted pottery.
[10] See figure 21 this text for ^{14}C dates from *Vela spilja*.

Corvo (Passo di Corvo Culture, Middle Neolithic) (Follieri 1973: 49-59) have each been found to have traces of Einkorn and Emmer wheat. Likewise, at the sites of Ripoli (Ripoli Culture, Italian Middle Neolithic) (Evett and Renfrew 1971: 403-409), and Grotto San Angelo di Ostuni (Matera Culture) (Castelletti 1972: 331-374), evidence has been found in the archaeological contexts that revealed a presence of Emmer wheat (Karg and Müller 1990: 378).

It is perhaps unfortunate that most of the sites mentioned in the two previous sections were not always sampled in a manner that would detect the presence of carbonized or preserved grains in quantity. Likewise, there seems to be a lack of connections described between grain processing lithic artifacts and domesticated faunal finds to perhaps shed light on regional cultural variations. Finally, it is not clear from many of the studies as to whether the materials are truly the domesticated variety or actually the similar wild variants that are proven to exist in the regional pollen records (see section 4.8).

4.11 Early Historical References: Local Palaeo-landscape

Any attempt to reconstruct palaeo-landscapes using early historical references (Greek or Roman) will prove to be highly problematic at best. Korčula was definitely on the periphery of the Greek world in Late Archaic times. The references to the Dalmatian Coast are fragmentary and extremely brief at best. Later, the well documented Greek colonies from the 4th and 3rd centuries B.C. on the nearby islands of Vis (Issa) and Hvar (Pharos) make it clear that the area and its landscapes must have been known. However, it should be pointed out that the emphasis here is not specifically on the palaeo flora and fauna. More specifically, the focus is on the overall landscapes that are described in the historical references, including soils, sea levels, presence of lakes, marshes, dense forests or any other naturally occurring factors.

The references from the early historical documentation of the Dalmatian Coast during the Late Iron Age to suggest that the Illyrians, Greeks, and Romans all viewed the same landscape with differing views. It is possible to explore the evidence suggesting that the same lands were exploited differently by contemporaneous cultures. These tendencies would, in turn, have direct impacts on the surrounding landscape. Therefore, the early references actually negate an environmentally deterministic approach to resource exploitations and landscape modifications on Korčula.

4.12 Historical Geographers

The Ionian historical geographer Hecataeus, of Miletus, wrote the *Periegesis* or "journey around the world", probably sometime during the 6th century B.C. This journey

text supposedly had an accompanying map that described the countries and peoples he encountered on his coastal voyage of the Mediterranean and Black Seas.

His work *"Europe"* emerges as the first solid geographical description that included the region now known as the Dalmatian Coast. Unfortunately, most of Hecataeus' works survive in a fragmentary form in a reference work by Stephanus Byzantius. The first accounts of the Dalmatian Coast region including its peoples that survive, are found in the *Periplus* of Pseudo-Scylax from Caryanda, circa 330 B.C., and use the results of contemporaneous voyages, although earlier material is thought to have been incorporated. Later, a compilation also known as the *Periegesis,* by Pseudo-Scymnus (circa 110 B.C.) emerges as a geographical reference, along with descriptive fragments that appear in Roman sources, such as Pliny or Strabo (Wilkes 1969: 3).

Incorporating early historical geographical references into a study of the landscape of Korčula should not be seen as definitive. There are many problems associated with using these sources as firm references and a proper discussion of these problematics is out of the scope of this study. It is popular belief that later geographers who also traveled in similar areas might have copied many passages, only to be viewed later as the originator (s) of the geographical descriptions. For example, Herodotus was believed to have been a follower of the path of Hecataeus' journey. He refers to Hecataeus and his voyage destinations often enough (Hdt. 2.143, 5.36, 5.124-6), so it is believed that he must have made use of Hecataeus' *Periegesis* (Hammond and Scullard 1970: 490). However, Herodotus does not attest to this fact openly and actually scorns map makers (4.36).

It should be noted that many statements by historical geographers might be copied, outdated, and altered to suit an audience or political patron back home. What might be stated as fact may be an edited and biased version of what was experienced. Essentially, half truths and outright lies might also be the case. Nevertheless, even with a high level of scrutiny applied to these historical geographies, it is perhaps possible to extract raw descriptive geographical information.

4.13 Strabo: Dalmatia, Korčula, and Native Inhabitants

The general references to Korčula in antiquity were briefly discussed in Chapter 2 (2.1). It is quite clear that these citations are by no means packed with detailed descriptions. However, it is possible to elucidate landscape information from the details that the later Greek historical geographer Strabo (64/3 B.C-ca. A.D. 21) gives for the Eastern Adriatic seaboard and its peoples. His record of the Dalmatian Coast details the following:

> "...The Dalmatians have the peculiar custom of making a redistribution of land every seven years;

and that they make no use of coined money is peculiar to them as compared with the other peoples in that part of the world, although as compared with many other barbarian peoples it is common. And there is Mount Adrium [the Dinaric Alps], which cuts the Dalmatian country through the middle into two parts, one facing the sea and the other in the opposite direction. Then comes the River Naro [Neretva River: see figure 2] and the people who live about it-the Daorizi, the Ardiaei, and the Pleraei. An island called the Black Corcyra [Korčula] and also a city founded by the Cnidians are close to the Pleraei, while Pharos (formerly called Paros, for it was founded by the Parians[11]) is close to the Ardiaei. The Ardiaei were called by men of later times Vardiaei. Because they pestered the sea through their piratical bands, the Romans pushed them back from it into the interior and forced them to till the soil. But the country is rough and poor and not suited to a farming population.." (7.5.5-6).

"...Now the whole Illyrian seaboard is exceedingly well supplied with harbours, not only on the continuous coast itself but also in the neighbouring islands, although the reverse is the case with that part of the Italian seaboard which lies opposite, since it is harbourless. But both seaboards in like manner are sunny and good for fruits, for the olive and the vine flourish there, except, perhaps, in places here and there that are utterly rugged. But although the Illyrian seaboard is such, people in earlier times made but small account of it-perhaps in part owing to their ignorance of its fertility, though mostly because of the wildness of the inhabitants and their piratical habits. But, the whole of the country situated above this is mountainous, cold, and subject to snows, especially in the northerly part, so that there is a scarcity of the vine, not only on the heights but also on the levels. These latter are the mountain-plains occupied by the Pannonians..." (7.5.10)

4.14 Examination of Strabo's Comments

It should be readily apparent that there is an abundance of bias in this description. Perhaps even more precisely, these are obviously ethnocentric views of a Greek in foreign lands (or describing foreign lands and populations). But, these ethnocentric comments tend to magnify the probable landscape scenario, which is the focus of this section. The following examination of Strabo's work is by no means based entirely on fact, but certain information can be extracted, however rudimentary in

[11] Now known as the island Hvar, and the town as Stari Grad or literally "Old Town". This town, Pharos (or Paros), was founded by the Greeks in 385/4 B.C. (Diadorus Siculus, 15. 13).

nature, and cautiously applied to the general palaeo-landscape of Korčula. Selected quotes from Strabo's passage are given below, with pertinent points to the discussion following in brief detail.

4.14.1 Dalmatian Land Distribution

"..The Dalmatians have the peculiar custom of making a redistribution of land every seven years..."

This comment confirms the view that land in Dalmatia during the Iron Age, whether landscaped for agricultural pursuits or left mostly unmodified for animal husbandry or even political purposes, was in fact valuable to the Dalmatians.

4.14.2 References to the Island of Korčula

"...an island called the Black Corcyra [Korčula] and also a city founded by the Cnidians [12] ..."

This statement allows a verification that the descriptions given by Strabo are in fact of lands and peoples living on or very near Korčula. The fact that these place names are mentioned at all is very important to the discussion. More often than not, historical geographies of periphery areas of the Mediterranean Basin lack sufficient details that allow the reader to locate or interpret exact locations.

Regarding the Eastern Adriatic, certain places such as the town of *Heraclea*, or "Heraclea with a port", are still not located, although mentioned in antiquity (Pseudo-Scylax *"Periplus"*: ch. 22). There is much debate among regional archaeologists as to where this one town might be located (see Kirigin 1990: 294-295 for an overview, Rendić-Miočević 1980: 235 for possible location of the town on Korčula, in Vela Luka). So, it is fortunate that Korčula (Black Corcyra) was specifically named in Strabo's account.

4.14.3 Describes the Dalmatians as Pirates Who Were Forced to Till Soils

"...Because they pestered the sea through their piratical bands, the Romans pushed them back from it [the Adriatic] and forced them to till the soil..."

From this comment, it is possible to extract some cultural and possible landscape information. The Illyrians were obviously recognized as pirates by the Greeks and probably Romans, so the comment that they were "forced...to till the soil" tends to imply that this was an agricultural activity that the Illyrians were not normally conducting, at least not on the massive scale the Greeks or Romans were accustomed. Since these Illyrians were not farmers, this would then imply that the lands of these Dalmatian

[12] See chapter 2 for a general review of the Cnidian colony issue on Korčula, and see Kirigin 1990:293-294, for further details of the problematics.

peoples were not modified for massive agricultural subsistence (see Wilkes 1969: 164, concerning names of native populations near Korčula).

4.14.4 The People in Earlier Times along Dalmatia and the Soils

"Both seaboards in like manner are sunny and good for fruits, for the olive and the vine flourish there...but although the Illyrian seaboard is such, people in earlier times made but small account of it-perhaps in part owing to their ignorance of its fertility, though mostly because of the wildness of the inhabitants and their piratical habits...."

This comment is perhaps the most descriptive. It is obvious that fruits, olives, and grape vines are important to Strabo, given his Greek origins. This of course reflects on Roman agricultural tendencies specifically since 28 *villae rusticae* have been documented on Korčula during this research. So, it can be suggested that upon seeing (or hearing of) peoples that do not use the landscape in a similar manner as the Greeks or Romans, Strabo thought to comment on the native inhabitants' tendencies.

Strabo goes on the say that those who lived in Dalmatia "in earlier times" did not extensively use the land for agricultural pursuits. Wilkes also states that this point must have struck ancient writers as odd enough to require comment and goes on to suggest that Illyrian motives for not using the terrain might be cultural and not due to limitations of the landscape (1969:180). These points will be explored later in the text. It is interesting to note that the earlier coastal inhabitants of Dalmatia who were identified and recorded by Greek writers only appear later in the literature as "once having lived" in Dalmatia, and almost drop out of the descriptions after the third century B.C. (Wilkes 1969: 154).

It might even be suggested that Strabo, after his second specific comment about the Illyrians being "pirates", implies that the Dalmatians living close to or on Korčula were professional pirates (and definitely not agriculturists). He even goes on to say that they were ignorant of the land's fertility. Nothing can be said about Illyrian ignorance of the land, but it is of interest to note that the soils at least were recognized as fertile, (i.e. in the position to be cleared, plowed, crops planted, tended, exploited etc.), but left mostly unused by the local Illyrians. Perhaps a final point of interest concerning the lack of extensive agricultural pursuits by regional native populations is a comment by Cassius Dio. He stated that "...they cultivate no olives and produce no wine except to a very slight extent and a wretched quality at that..." (cf. Dio, XLIX, 36-2).

4.17 Conclusions Regarding Historical Geographer Descriptions

This information from the historical geographers dovetails well with the data from the core samples of Malo Jezero on the nearby island of Mjlet, although it is by no means conclusive. Various factors were described, such as proximity of the core samples

to the area of study, to suggest that Malo Jezero samples might carry biases when compared to Korčula's palaeo-floral landscape. In any case, the historical geographer descriptions tend to couple with the known palaeo-environmental data, but many questions are still very unclear and can be summarized as the following:

1. Were the Bronze and Iron Age inhabitants of Korčula unlikely to have been extensive farmers or at least did they make but minimal use of large scale landscape agriculture?

2. Was the terrain, vegetation, and landscape more or less unmodified by these inhabitants?

3. Did the potential for large scale agriculture exist, or rather, could the soils of the time sustain an agriculturally based economy?

4. Why were these soils generally recognized as unused by outsiders (e.g. the Greeks and Romans) ?

There must have been soils available to support alternative economies prior to the Iron Age. However, if the general landscape of Korčula was relatively unmodified, what were the locals doing for their economies? These are many of the questions that are still unanswered regarding the Bronze and Iron Age communities on the eastern Adriatic islands.

Chapter Five

A Review of Past Bibliographic and Archaeologic Studies on Korčula

5.0 Korčula: The Bibliographic and Archaeologic Overview

As mentioned in the Chapter 1, the island of Korčula has had archaeological investigations prior to this thesis research. The majority of these studies have consisted of brief field examinations or descriptions of isolated finds. Most completely lack quantitative data collection, but many of these studies do lay down a basic framework for an intensive study of the island's long and varied past.

Korčula has been more or less overlooked in the regional archaeological picture, when compared to the amount of research conducted on other islands such as Hvar, Vis, Palagruža, Brač and Šolta. The coast and islands have traditionally been divided into zones of what can be termed "scientific or research" areas. Korčula falls under the legislative control of the Dubrovnik region, but most inquiries were usually directed to the more well known museums, historians, and archaeologists up the coast, in Split. However, the teams working out of Split did not have specific authority to direct, sponsor, or otherwise support archaeological fieldwork on Korčula without some form of collaboration from Dubrovnik. In any case, just prior to the break-up of the former Yugoslavia, there were no major archaeological projects (except for the Vela špilja excavations), that had been conducted on, or were planned for, Korčula.

5.1. The Korčulanski Statut of 1214-1265

The recent re-publication of the *Korčulanski Statut,* of the town and island of Korčula (Jeličić et al. 1995), will prove to be an invaluable asset to archaeological research on the island. However, the archaeologic potential of the document has yet to be fully explored. The original *Statut,* dating to at least 1214, and established entirely by the local islanders, details daily aspects concerning the community, such as animal husbandry, farming, wine production, logging and lumber industries, and many other activities on the island.

The *Statut* was expanded when the rector of Dubrovnik, Marsilius Georgij, pressed the islanders into his (and perhaps more importantly, Venetian) control. Marsilius Georgij approved the existing statutory regulations and by 1266, had passed the later variant of the Statute, which is the version usually found in the various reprints. The original Latin text, including many toponyms still in use on the island (see Hanel 1877: 131-137 or 1995: 475-481), was even published as a working document by

the Venetians in 1643, perhaps for legal, business, or trade purposes. This practical use of the Statute is further evidenced by the fact that the Venetian edition even had an accompanying Italian translation.

The text from the 1266 document is the oldest Croat legal code and, except for the Russian 11th-12th century *Pravda,* it is the oldest known Slavic legal record (Jelečić et al. 1995: 528). While it is rather fortunate that such an historic work has survived, more extensive details concerning this text are outside the scope of this thesis. However, with numerous references to land use and farming practices, information can be gathered concerning the modifications to the landscape before and during Medieval times. These facts would then be pertinent to the extremely complicated pedogenic processes on the island.

Preliminary examination of the *Statut* reveals certain points of archaeological significance. Many pre-Venetian toponyms on Korčula are mentioned in the *Statut*. On the western end of the island, positions such as *"...vela Luca, cum Spila et sub Spila..."* (see appendices b; KV-012), *"...terram..gomila..."* (appendices b; KV-019) and *"...terram..Gradina..."* (appendices b; KV-006 and KV-007) are mentioned (Hanel 1877: 131). These are direct references to both the well known Vela spilja, now as a rich Neolithic and Eneolithic cave site, and two prehistoric and protohistoric localities surveyed during the thesis research. Other prehistoric sites, such as *"...locum vocatum Gradina"* (op. cit.: 134) near the village of Smokvica (appendices b; KS-001), and *"...primis Gradaz"* (op. cit.:136), between the towns of Lumbarda and Korčula (appendices b; KK-006), are also directly mentioned in the 13th century text.

It is clear that these references to toponyms of archaeological significance are important. Since the *Statut* was first written by the islanders of Korčula, one can assume that these toponyms were in use long before the document (prior to 1214). Many of the toponyms, such as *"..primis Gradaz..."* (*Gradaz* is the Latin spelling for the local Croatian "gradac", or "gradać", which generally translates as "a hilltop settlement"), were later changed to correspond with churches built on these positions. In the aforementioned case, the *" ...Gradaz..."* of 1214 is now known as Sv. Antun, or St. Anthony, named after the patron saint of the church *now situated* (author's emphasis) on that hilltop. Although the full archaeological potential of this document has yet to be realized, it is clearly a unique and highly supplemental source to local research.

5.2 The Early Archaeologists and Historians

One of the first literature references directed specifically towards the archaeological aspects of Korčula is a brief description of numismatic finds from the island (Kapor 1839: 64-65). General historical information concerning the island was

published by Nikola Ostoić, including the description of a now destroyed Roman villa rustica by the Greben shipyard in Vela Luka (1878: 12) and the Smokviške Gradina (op. cit.: 95) (site KS-001). Ostoić also published a topographical and historical work focused on the town of Vela Luka and the natural surroundings, including a mention of Vela Spilja (Ostoić 1853), although this reference was well before the cave's deposits were known to hold archaeological material (Čečuk 1986: 46).

Numerous archaeological investigations were conducted by Frano Radić (see Gjivoje 1972: 131-137 for further details of the researches of Frano Radić throughout the region) and Vid Vuletić-Vukasović and these are perhaps the first with a purely archaeological focus. Among other sites and finds mentioned are the numerous prehistoric cairns found on the Potirna polje, the Gradac prehistoric hilltop structure (KB-003), and the Smokviške Gradina (Radić and V. Vuletić 1887: 104-111). Frano Radić also discussed briefly the Roman villa (site KP-014) on the position of Kneža bay (Radić 1887: 75), as well as the Roman evidence from the Luka banja bay (site KK-001), near Žrnovo (1892: 77-79). Radić published brief details of Greek and Roman evidence from the Lumbarda area (1887: 10-24, 1891: 42; see Alibranti reference). Likewise, Radić detailed two small Greek inscriptions found on Korčula (1891: 42-43), and was the first archaeologist to investigate the extensive ruins of the Palaeo-Christian church "Sv. Barbare" (1892: 50-52). The latter site is on the islet of Sutvara, located in the Pelješac Channel, between Korčula and the Pelješac Peninsula.

Minor prehistoric observations, mostly concerning artifact find-spots, were also offered by Radić and Vukasović concerning Korčula (1888: 46-47) and the nearby Pelješac Peninsula (1890: 73-78). Radić and Vukasović (1894) also published the first description of the cave above the bay of Samograd (KP-015), while Vukasović discussed numerous small Greek and Roman finds such as inscriptions (e.g. 1883a: 70; 1883b: 94). The rather well preserved Roman villa (site KL-007) with its unique *opus reticulatum* construction was also briefly described by Alibranti (1886: 121-123).

Finally, the cave site known as Jakasova spilja (Jakas' cave) was briefly investigated in the early 1900s by numerous visitors. Juraschek noted that the cave had prehistoric occupations of some kind, using the surface scatter pottery as an indicator (1916: 170-171, 1916: 115). However, these observations were published long before regional Neolithic and Eneolithic chronologies were established or even known (i.e. Hvar Culture, Vela Luka Culture, Danilo, etc.). So, while these early discoveries are important for general historical information, they lack significant data that can be translated into the current researches. The cave was also explored for speleological interest by Marčić (1916: 170) and Girometta (1924: 120).

5.3 Overview of Recent Archaeological Research and References

Complete textual details of all archaeological references to Korčula would be outside the scope of this discussion. Pertinent bibliographic references to sites on Korčula and the adjacent islets have been detailed in the data base found in "Appendices b". After thorough review, it is clear that many of these references are very general and often vague regarding prehistorical and protohistorical discussions. As previously mentioned, the island has had only a few sites excavated, and only one of those sites (Vela spilja) has had any type of quantitative data recovery. Since the end of the Second World War, the majority of the archaeological articles of importance have come from only a small group of authors. Those archaeologists who have actually worked on Korčula in any capacity, and whose work is pertinent enough to this thesis to require discussion, are: Marinko Gjivoje, Grga Novak, Franko Oreb, Petar Lisičar, Cvito Fisković, Duje Rendić-Miočević, Božidar Čečuk, and Dinko Radić.

5.3.1 Marinko Gjivoje's Contributions

Gjivoje can be generally recognized as the first archaeologist and historian who attempted to collate the known archaeological record on Korčula into one gazetteer. The initial research (1952: 204-206) was superseded by a more thorough examination with an accompanying distribution map (Gjivoje 1969: 38-44). It should be noted that this evidence was not gathered through systematic survey, but rather derived from bibliographic survey and local knowledge of suspected prehistoric sites.

Perhaps a more vital contribution by Gjivoje to the archaeology of Korčula was the opening of the first trench in Vela spilja, situated above Vela Luka bay, in 1950 (Gjivoje 1955). The research in the cave was handed over to Grga Novak in 1951 (Novak 1954: 4 1-56), but it was Gjivoje who began the excavations and realized the potential of the massive cultural deposit. Gjivoje also briefly opened a discussion concerning the known prehistoric hilltop settlements on Korčula (see Gjivoje 1969: 40-41). Unfortunately, since there was no proper survey conducted at that time, Gjivoje's text is quite preliminary in nature. Clearly, only about 5 prehistoric hilltop structures were known to Gjivoje at the time[13].

Gjivoje is credited with the discovery of an Eneolithic site on the small islet known as Badija (Gjivoje 1969: 38-39), due 1.5 km. east of Korčula town (see fig. 3). The material was found on a position with the toponym Lokva (seasonal pond) that is situated on the eastern end of the islet. The lithic artifacts, consisting mostly of flint blades with some measuring more than 25.0 cm., are now on display in the Korčulanski

[13] For comparison purposes, note that this thesis research has detected and taken account into the data base of no less than 35 prehistoric hilltop sites.

Muzej. Unfortunately, nothing further was detailed about the finds, the site, or any other associated information.

The geographic setting of Badija and the site's location near a fresh water source make the finds quite significant. The lithic finds from that site (material and typology) do correspond rather well with similar examples excavated from Vela spilja, and associated with Eneolithic occupations. Also of note is the presence of extremely long blades of the same type associated with an infant urn burial, uncovered in the Eneolithic strata of Vela spilja. A well worn granite pestle was associated with this burial, and since the material is not indigenous to Korčula, the Badija island site might prove to be a vital geographic link for trade between the mainland and Korčula.

5.3.2 Grga Novak's Contributions

Grga Novak was possibly one of the most respected Dalmatian archaeologists. Regarding Korčula, Novak investigated more than a dozen localities, including prehistoric and cave sites, Greek and Roman find sites, and reported his findings and observations (1954: 41-56 and 1955: 227-230). Views concerning the complicated and still undetermined locations of the 6th to 4th century B.C. Greek colonies on Korčula (Kerkyra Melaina) were also given (1961: 161-165). However, while Novak's work on Korčula can be seen as perhaps secondary to his other researches in the region, he nevertheless contributed crucial insight into the archaeology of Korčula.

Novak's cave excavations on the nearby island of Hvar in Grapčeva spilja and Markova spilja, exposed the Late Neolithic cultural assemblage now recognized in the region as the "Hvar Culture" (see Novak 1955; 1959: 11-39 for Grabak Cave; for Markova spilja see Novak 1959: 5-60, 1961: 615-619, 1962: 19-102, 1967: 95-234, and 1968: 57-126). The most diagnostic Hvar Culture wares, course monochrome wares, highly polished black or dark brown wares, often incised with hatched, geometric, and "wave" motifs, frequently painted with red ochre or cinnabar after firing, have been found at numerous sites in this region of the Dalmatian coast. Since the "type-sites" on the island of Hvar are situated adjacent to Korčula, it would seem logical that the Hvar Culture pottery would also be found on Korčula.

In 1951, Grga Novak took over the excavations at Vela spilja from Gjivoje (Čečuk 1986: 46) and diligently published his initial findings shortly thereafter (Novak 1954: 49-50, and see accompanying plates). Novak established that Hvar Culture material was present in the deposit at Vela spilja and that Eneolithic and Bronze Age deposits were overlying the Hvar Culture. Unfortunately, Novak did not publish much more from Vela spilja (unlike his extensive publications from the caves on the island of Hvar), so the findings did not receive any further analysis.

During his researches on Korčula over the 1951-52 seasons, Novak also visited a few other sites and conducted brief investigations. He confirmed that Jakasova spilja contained "miscellaneous fragments of prehistoric pottery", including Bronze Age fragments and typologically and stylistically diagnostic fragments of Hvar Culture pottery (1954: 44-45). Since Novak did not detail any significant sub-surface testing, it should be assumed that the finds were all from surface collection.

Novak also visited the cave known as Spilja na brdu Glogovac and reported sub-surface findings of undiagnostic prehistoric course wares and one fragment of a Greek vase (1954: 44). Likewise, visits to the caves Žukovica and Spilja Samograd (u uvali Samograd) verified that there were prehistoric occupations at these sites (1954: 54). However, the caves were only visited briefly and no sampling, either surface or sub-surface was conducted. It can be surmised from the text that prehistoric evidence of some kind was seen by Novak, although the exact extent and type of material was not offered.

5.3.3 Researches of Petar Lisičar, Cvito Fisković, Duje Rendič-Miočević, and Franco Oreb

Petar Lisičar's work on Korčula was primarily focused on the Greek and Roman archaeology, with most of the focus on Greek associations with the island. Lisičar dedicated a complete text to an intensive historical, archaeological, ethnographic, and linguistic examination of the early 6th century B.C. and 4th/ 3rd century B.C. Greek colonies on Korčula (Lisičar 1951). Lisičar also examined minor Roman inscriptions (1958: 125-129), Greek and Hellenistic artifacts found on the island, such as coins (1963b: 74-81), arc-type fibulae (1963a: 25-36), a Greek vase from the Kopila hilltop structure (1949: 38), and Corinthian and Hellenistic/ Gnathia wares (1973: 3-28, and see same article, figs. 10 and 29).

Cvito Fisković conducted numerous investigations concerning the prehistoric, Roman and Palaeo-Christian evidence on Korčula and the nearby islets (ex. 1975: 156-163, 1984: 5-27, and 1986: 153-156). D. Rendić-Miočevic examined the many problems associated with the 4th/ 3rd century B.C. Psephisma inscription found in the area of Korčula known as Lumbarda (e.g. 1965: 77-80, 1966: 133-140). Later, he focused on the problems of detecting evidence in support of the 6th century B.C. Cnidian colony on Korčula (1980: 229-250).

Franco Oreb has conducted many types of archaeological and historical investigations on the island of Korčula. Oreb examined the many archaeological sites in the area near Vela Luka, including the Potirna polje, with an emphasis on the history of research in the area and general site descriptions (1972: 123-130). Oreb detailed the nationally protected historical sites on the island (1986: 5-24) and later conducted sub-

surface research on the remains of a Roman villa situated on the edge of the Blatsko polje (1988-89: 203-211). Finally, Oreb has had a significant role in the ongoing excavations at Vela spilja, and has assisted with numerous campaigns.

5.3.4 The Recent Research of Dinko Radić

Although Professor Radić has worked briefly on his native island of Vis (Radić 1986: 20-21), he has spent most of his academic life with his family on Korčula. Except for the Vela spilja excavations, in which he has played a key role under Dr. Čečuk, Radić has received no outside support for his own archaeological investigations. Radić has detailed the archaeological aspects of the Potirna polje, including a summary of the past research in the area, and a brief description of the prehistoric and Roman evidence (Radić 1989: 45-47). He has co-authored the initial KARG publication with the author (Radić and Bass in press: a), as well as an overview of the prehistoric hilltop structures surveyed on Korčula (Radić and Bass in press: b).

Radić has been the director of the *Centar za kulturu,* Vela Luka, for many years and has conducted personally funded research in specific localities. Much of his personal work (unpublished) has included a very detailed survey of rare bibliographic references concerning Korčula, land reconnaissance in certain localities across the island, and a brief summary (typed manuscript) of known archaeological sites prior to the KARG survey. Radić currently teaches history and archaeology in the local secondary school, maintains the *Arheološki muzej* in Vela Luka, and is the curator of the vast collection of artifacts from Vela spilja (see Čečuk and Radić 1995). Presently, Radić is also conducting a systematic and quantitative study of the Late Neolithic Hvar Culture pottery excavated from Vela spilja.

5.3.5 Božidar Čečuk and Vela spilja (The Big Cave)

Since the death of Grga Novak in 1978, Božidar Čečuk has lead the excavations at Vela spilja (e.g. Čečuk 1975: 64-65, 1980: 25-34, 1981: 16-17, 1982: 25-27, 1986: 46.-47, 1989a: 44-46, 1989b: 16-18, 1992: 43-49, and Čečuk and Radić 1995). The situation in the cave is quite unique in that there are cultural materials from the Early Neolithic, with its diagnostic Impresso pottery (Čečuk 1992: 47), Middle Neolithic pottery (Vela Luka Culture) with links to the Danilo-Ripoli-Kakanj complex (Čečuk 1986: 47), Late Neolithic Hvar Culture, Eneolithic, Bronze Age and Iron Age. The archaeological evidence also extends into the proto-historic Greek, Roman, and Byzantine occupations (Čečuk 1989: 46).

Currently, the academic and scientific aspects of the cave, including the archaeological materials, are under the control of Dr. Čečuk. Prof. Radić has allowed the

author access to all materials held in the *Arheološki muzej,* in Vela Luka. However, it is beyond the scope of this thesis research and professionally unethical to attempt to examine the materials from Vela spilja without Dr. Čečuk's permission. He has given the author (summer 1996) scientific and publication rights concerning XRF and XRD analysis on selected pottery from the cave. In the near future, it is hoped that further access will be given to Prof. Radić and the author to continue the research in Vela spilja.

A review of the materials has revealed that the evidence comes from almost all known regional prehistoric phases and typologies. As will be discussed in the next chapter, the connections between finds from Vela spilja and other regional sites is very striking. It should be noted that the materials have received little specialized analysis and lack a quantitative review. One published radiocarbon date (Z-1742; 5430±100 BP) has come out of almost three meters of open trench excavation. Although the many publications related to the excavations give insight into the nature of the deposit (see appendices b: KV-012), it is hoped that in the near future, a lengthy publication will be prepared on these important archaeological findings.

Burial evidence has been documented in the cave that is of particular interest to regional archaeological studies. Although skeletal fragments have been recovered from other Neolithic sites (e.g. Novak 1955: 309, 345-346), the Vela spilja remains are rather important. There are no other *in situ* Neolithic burials known from the East Adriatic. During the 1985 season, two burials were discovered in the Late Neolithic Hvar Culture levels. The skeletons have been identified as a 36 year old female and a 16 year old male. Both individuals were buried on their sides, in flexed positions, with a stone placed below each cranium. The bodies were ca. 1.5 meters apart and both skeletons had Hvar Culture pottery associated with the burial contexts, while one individual had a pile of sea snail shells arranged around the cranium.

During the 1986-87 campaign (Čečuk 1989: 44-46), two other burials were discovered in Vela spilja (trenches b-f x 19-22m, and g-j x 18-22m). The archaeological contexts are not well understood, so a reconstruction of the pertinent stratigraphical sequences associated with the burials is problematic. Below the Impresso pottery phase (Early Neolithic), underlying a ca. 80 cm. deposit, containing, animal bones, a few lithic artifacts, snails, and shells (but no pottery evidence), two poorly preserved skeletons were found. The burials were surrounded by stones and cobbles which, as Čečuk claims, indicates a type grave construction (ibid.: 44). The individuals have been identified as between 2 and 4 years of age, and next to one of the skeletons, avian bones were discovered.

Prof. Radić (pers. com.) has stated that the burials were actually below a stone and cobble layer. Hence, the situation might be that, contemporaneous with the Early

Neolithic occupations in the cave, a trench was dug to bury the individuals. The individuals were placed into this trench, covered with the aforementioned stones and cobbles, and then further covered with some sort of midden-type materials. Čečuk has suggested that the burials are possibly from a pre-pottery occupation in Vela spilja. This would imply that these are actually Mesolithic burials. Even though a few Mesolithic finds have been detected on Korčula during this thesis research, it is premature to suggest that these are pre-Impresso Neolithic burials simply because they appear to be buried below the Early Neolithic horizon.

Finally, one other burial has been uncovered in Vela spilja (Čečuk and Radić 1995: 44.). An urn burial containing the remains of an infant was found in the levels that correspond to Eneolithic occupations. The materials associated with the burial consists of cranial and long bone fragments, one well worn granite pestle, and ca. 6 chert blades all measuring ca. 15 cm. in length.

The large faunal assemblage uncovered during the excavations at Vela spilja has not been examined in a quantified manner. Any changes in the assemblage profile over the cave's long occupations have yet to be examined. Many of the finds were identified to species at the request of Čečuk, but the associations to specific occupations are not well detailed. A table has been created for general reference, associated with this thesis research, to illustrate the genus/ species, common name, and where possible the local name of the faunal evidence from Vela spilja (see fig. 36). It is clear that the subsistence strategies related to the cave's occupations are rather varied between terrestrial and marine resources. Hopefully, this valuable faunal assemblage can also be fully studied in the future.

Chapter Six

An Overview of Dalmatian Prehistory and Protohistory

6.0 Adriatic Basin: A Review of Coastal and Island Prehistory

A complete discussion of the pre- and protohistory of the Balkans, including the Adriatic Basin, is well out of the scope of this thesis. The general geographical limits of this discussion are: western Montenegro, western Herzegovina adjacent to the Dinaric Alps, western Croatia, the Dalmatian Coast, and the adjacent islands. However, sites in other parts of the Balkans, such as the Iron Gates region of Serbia, or across the Adriatic along the Italian coastline, will also be discussed regarding specific connections with Korčula or other parts of Dalmatia. As the title of this chapter implies, the focus will be primarily on the immediate Dalmatian Coast and East Adriatic islands.

6.1 The Palaeolithic Evidence from Dalmatia

Research into the Palaeolithic of Dalmatia is quite sparse. The evidence published concerning this period of the west Balkan region tends to be rather thin. Likewise, extensive fieldwork has been restricted to only a handful of sites (Alexander 1972: 170). This situation prevails and is evident in even the most recent publications focused on the Palaeolithic of the entire Balkan region (e.g. Bailey 1995: 19-20) . The reasons for the lack of recent published materials are not clear. It is probably safe to assume, like elsewhere in Europe, that Post-Glacial geologic and pedogenic activity has shrouded much of the Late Pleistocene archaeological evidence. A general review of regional archaeological journals, predominantly former Yugoslav, tends to suggest a trend of disinterest regarding the archaeological and environmental problems associated with the Palaeolithic.

The best summary of the Dalmatian Palaeolithic is probably by Malez (1970: 1-16), although due to a lack of quantified finds from numerous sites, the discussion is quite brief. Unfortunately, most of the studies have been entirely focused on tool typology, which clearly reflects in the published literature, with almost no applicable ^{14}C dates. Generally, it can be summarized that from ca. 70, 000 -40, 000 bc (uncal.), the various Mousteroid assemblages are present, while from 40, 000/ 35, 000 -8000 bc (uncal.) the Aurignacian and Gravettian tool kits prevail.

Perhaps the most significant site in terms of Palaeolithic remains is the cave known as Crvena Stijena, due east of Korčula in western Herzegovina (see fig. 32). The cave site has approximately 20 meters of sedimentation, which include 31 identified

horizons (Brunnacker 1967), extending from the pre-Mousterian phase of the Palaeolithic, through to the Bronze Age (Malez 1970: 4, 6; Basler 1967).

The strata from XXXI-XXIX have been identified as pre-Mousterian, while XXVIII and XXV have artifacts of proto-Mousterian typology (Levallosian core flakes tools and points with unifacial retouch). The sedimentation from XXXI through XXV have been assessed to the Riss glacial period. Stratum XXIV is the first cultural horizon which carries the typical Mousterian lithic assemblage (e.g. use of prepared levallois cores, retouched flakes, greater presence of bifacial tools, etc.) and is associated with the early part of the Last Interglacial (Eemien) period. The materials associated with XXII show certain differences compared with the atypical Middle Mousterian assemblage and have been called the *Küstenmoustérien* or the "coastal variant" (Malez 1970: 4), although like the so-called "Alpine Mousterian", this is probably based more on location than on actual assemblage characteristics (Alexander 1972: 21). Strata XXII through XI extend from the Middle and Late Mousterian into Aurignacian, with levels X through V revealing a typical Gravettian assemblage (bifacial and tanged points, retouched burins, levallois core blades), with the Early Holocene stratum IV having triangulates and trapezes which are common in regional Mesolithic tool kits.

Scarce surface finds from Ražanac, on the coast north of Zadar, probably link to known Mousterian assemblages (Batović 1965, and plate 4/ A-C in Malez 1970). Finds from the Dalmatian islands are equally as sparse. Materials from the Palaeolithic have been found on the island of Dugi otok on the toponym of Veli rat (Late Mousterian and Early Aurignacian tool types), and the island of Rab at the Lopar site (Gravettian assemblage) consisting mostly burins, scrapers and retouched levallois core flakes (Malez 1967; Malez 1970: 5, 11-12).

Excavations on the island of Brač (see figs. 2 and 32), at the cave site of Kopačina, have revealed the presence of Late Aurignacian and Gravettian lithic assemblages, with possible analogies found among the V -VII strata of Crvena Stijena, and Epi-Gravettian materials that correspond to stratum IV at Crvena Stijena (Čečuk 1981: 9-10; Čečuk 1986: 32; Čečuk 1992b: 37-42). Research on the islands of Cres, Lošinj, and Krk, (off the north coast of Croatia, just south of Rijeka) has detailed Gravettian and Solutrian lithic assemblages and bone tools which suggest intensive resource exploitations in the north Adriatic zone (Mirosavljević 1970: 47-56). Although cave paintings and similar rock art are quite scarce in the region, the South Dalmatian cave site of Lipci gives evidence of deer and various sub-rectangular shapes, which have been carved into the rock, and associate with a Gravettian tool industry (M. Garašanin; in Alexander 1972: 25-26).

6.2 The Mesolithic or "Intermediate" Evidence from Dalmatia

Like many other areas of the Mediterranean Basin and Europe as a whole, the nature of the "Mesolithic" on the Dalmatian Coast is not well understood. Perhaps a better description would be that the period, best illustrated by Clark as the Intermediate Phase or "gap" of the Stone Age (cf. 1980: 1-9, 103), is haphazardly sampled and radically misdiagnosed. Until fairly recently, there were no ^{14}C dates (Alexander 1972: 27), and only a few sites have published in the interim with associated radiocarbon dates which can be of relative use (cf. Srejović 1974: 5; Čečuk 1985b; 1989b; Frelih 1986: 33; Srdoć et al. 1987: 140; Malez 1979a, 1979b, 1981; Alessio et al. 1984: 245-254; and a general overview containing tabular ^{14}C data in Chapman and Müller 1990: 127-134).

A recalibration of the associated dates was performed by the author using the bidecadal Stuiver, et al. calibration curve (1993), and it became clear that many of the Late Mesolithic dates overlap well into the Early Neolithic period. This latter point will be discussed at length in the following chapter. Likewise, it should be emphasized that specialized sampling for palaeofloral evidence such as grains, carbonized organic materials, or pollens was rarely, if ever, on the excavation agenda at most of these Mesolithic sites.

The aforementioned site of Crvena Stijena could reveal the best insights into the Mesolithic and the so-called transition to the Neolithic due to the well preserved nature of the stratification, but unfortunately no ^{14}C dates have been associated. At Levels IV through VI of Crvena Stijena, microlithic tools (non-geometric microliths and back bladed crescents) were found in a context underlying the Early Neolithic cultural deposit. This stratigraphically implies complete non-contemporanity, although the interface of the deposits did not receive any scrutiny, and therefore, the "transition" period is still not at all clear.

The cave site of Kopačina spilja, on the island of Brač, has revealed a non-geometric microlithic assemblage which is reported to have Epi-Palaeolithic and, specific to this section, Mesolithic associations to the level IV at Crvena Stijena (Čečuk 1986: 32). The tool kit mainly consists of backed blades, crescents, bifacial points, and scrapers of various shapes with a clear absence of trapezes or triangulates (cf. Čečuk 1992: 39-40, 42). The faunal remains, although not well discussed in the literature, are all wild species and include *Bos taurus primigenius* (auroch), *Capreolus capreolus* (roe deer) *Cervus elaphus* (red deer) (Čečuk 1986: 32) plus *Castor fiber* (beaver), *Lepus europaeus* (wild hare), and *Sus scrofa* (wild boar) (Chapman and Müller 1990: 129). A few bone tools were also recovered, as were undiagnosed avian bones and shells from marine (salt water) mollusks (Čečuk 1992: 41-42). Mollusks sampled from the tufa levels just above

the horizon described as "Late Mesolithic" have been ^{14}C dated to 7850±140 BP. (Z-778; uncalibrated), providing a *terminus ante quem* for the underlying Mesolithic stratum.

The cave known as Odmut, in northwest Montenegro (see fig. 32), has one horizon with Mesolithic finds which has been divided into two layers; Ia and Ib. Dates were obtained from the strata (Srejović 1974: 5), and have been recalibrated for this research (fig. 25). Most of the lithic artifacts from the Odmut I stratum are a grey-green chert, although some tools were manufactured from a more granular, grey or reddish, chert. The stratum had numerous unretouched flakes, side notched scrapers, end scrapers, retouched blades, retouched points, and numerous geometric microliths, mainly trapezes (Srejović 1974: 3-5). The scrapers are described as noticeably larger in Ib, along with the first appearance of circular shaped scrapers, but points bearing retouch on both edges were only present in Ia. The microliths were found in both Ia and Ib, while numerous polished stone tools (pestles, some used alternatively as hammerstones, one covered in red ochre) were also recorded throughout the entire stratum. This fact naturally brings potential pre-pottery agricultural practices into the Late Mesolithic picture.

Bone tools, such as awls and chisels, were also recovered, with a few made from wild boar teeth. One bone was decorated with angular incisions and polished. Of particular interest are about 56 antler harpoons found in the Odmut I stratum. Most are flat harpoons, with a few double barbed variants, and some cylindrical examples. Numerous of the flat-type variety have been perforated near the point, while a small proportion were found to have two holes.

The flint and chert tools are quite similar to those recovered from the coastal Mesolithic cave site in Greece known as Franchthi (Jacobsen 1969: 354-358). The radiocarbon dates from Odmut I are also quite close to those obtained from Franchthi (op. cit.: 374-375). General lithic connections have also been made to the assemblage found at Crvena Stijena (strata VII-IV), while the boar teeth and antler artifacts from Odmut tend to be particular to this Balkan site (Srejović 1974: 5).

At Grotta Benussi, just north of the Pula Peninsula, geometric microliths (trapezes and triangulates), along with a "long blade" assemblage, have been documented at this later Mesolithic site (Alessio et al. 1984: 245-254). Wild faunal remains include *Capreolus capreolus, Cervus elaphus,* and *Sus scrofa,* while the marine evidence includes fish and mollusks (Riedel 1975; in Chapman and Müller 1990: 131, 134). A similar lithic assemblage, including the presence of non-geometric microliths in the toolkit, was found at the west Slovenian site known as Breg (Frelih 1986; and for the ^{14}C dates, Srdoć et al. 1987). The site of Podosojna peć (Malez 1979a; 1979b; 1981), is associated with a predominantly "long blade" assemblage of the Late Mesolithic.

It should be noted that the numerous ^{14}C dates obtained from Late Mesolithic sites are from a variety of different materials (charcoal, shell, collagen extraction), many possibly from bulk-samples, many tested in different labs, and most lack extensive descriptions regarding exact archaeological context. A recalibration of the dates could be offered in the future, but only from sites which have the most reliable evidence for Late Mesolithic occupations.

6.3 The Neolithic of the Dalmatian Coast

It has been noted that up to 1988, there were absolutely no ^{14}C dates from the coastal areas of the East Adriatic associated with the Neolithic. Prior to this, the chronologies were derived through radiocarbon dates from adjacent areas and associated to the similar ceramic assemblages on the Dalmatian Coast (Chapman 1988: 5). Unfortunately, the situation has changed little since the late 1980s up to the present. Although there are a few Early and Middle Neolithic published (and semi-reliable) dates, there are still no Late Neolithic dates. However, this situation should change in the near future. The well known excavations in the cave of Grapčeva spilja, on the island of Hvar (e.g. Novak 1955), were resumed during the summer of 1996. At the time of this thesis, numerous Late Neolithic-associated samples are being dated from this cave (Kaiser pers. com.)

Until this data is published, the few absolute dates from the Dalmatian Neolithic can only be supported by established ceramic chronological sequences, many of which are not well investigated. Therefore, many phases or transition periods throughout the Neolithic, such as the associations between the so-called Middle Neolithic Vela Luka Culture and the Danilo Culture or the procession from the Late Neolithic through to the Eneolithic, will remain unclear. This situation will remain until further isotopic dates can be applied to support or refute these "established" ceramic chronologies. (Note: figure 32 should be consulted for the locations of the major sites mentioned in the following text.)

6.3.1 The Early Neolithic of the Dalmatian Coast

The only published study prior to 1994, focused entirely on the Early Neolithic of the East Adriatic, is Batović's *Stariji Neolit u Dalmaciji* (1966). The only published work since then which has been devoted entirely to that period is Müller's *Das Ostadriatische Frühneolithikum* (1994). As will become apparent in this section, the overall published body of evidence from the Early Neolithic of Dalmatia is not particularly large when compared to other areas of the Mediterranean Basin (see the discussion in Guilaine 1979: 22-30). It has been stated that, settlement or occupational evidence from Early Neolithic farmers along the Dalmatian Coast appears well into the 6th Millennium BC

(Chapman and Müller 1990: 128). However, if farming and impressed pottery are the only associated criteria to be examined, then farming could possibly stretch back into the 7th Millennium BC. This later point could be supported by evidence of early impressed wares from the West Adriatic coast of Italy (cf. Whitehouse 1969: 267-311; 1987; Guilaine 1979, and see Chapman and Müller 1990). Unfortunately, the level of understanding regarding the very early phases of the Early Neolithic is not well understood or researched and therefore, lacks descent discussion in archaeological literature.

Impressed or Impresso wares are named after the stylistic impressions, notches, and incisions often made on the outside of the pottery (see fig. 34). Although some of the early patterns appear to be quite randomly applied, typologies have been constructed which seem to give a good profile of the various Impresso manifestations. Perhaps the best and most recent summary specifically focused on the Dalmatian Impresso variants and chronology has been offered by Müller (1988: 230-232) although Batović previously illustrated many aspects of the material (1966: 53-68, 219-223).

The "Impresso A" is diagnosed by the simple, unconnected, and often wide stamps, impressions, or notches put into the ceramic. The impressions tend to be uneven as they run across the surface of the pottery and can appear randomly placed with minimal conformity. Many of the impressions have been made with the Cardium shell, hence the common term for variants of the pottery as "cardial impressed" although technically speaking, impressions can be made from numerous types of other shells. Finger nail impressions are common, as well as those produced from lithic points or similar pointed or semi-blunt objects. A few samples of the Impresso wares are not actually "impressed", although the ceramic material tends to be identical to the impressed variants. The "Impresso A" tends to date as the earliest impressed wares found on the Dalmatian Coast and adjacent islands.

The "Impresso B" also has the simple stamp motifs, but includes impressions that can be categorized more as linear patterns or grouped patterns. Likewise, so-called "Zigzag" patterns are found, stamped or notched into the pottery surface.

The next phase can generally be called the "Tremolo" phase, although Müller's description as the *Tremolo-Linienführung*, or "tracked tremolo lines", is perhaps a more accurate physical description (op. cit. 231). A few characteristics of the Impresso A linger, and numerous Impresso B motifs are found. However, the diagnostic motif from this phase is the tracked or connected tremolo lines found stamped and notched into the pottery. The tremolo lines appear as very small seismograph-type lines, and are arranged in a number of patterns across the outer surface of the vessels.

The final Impresso phase of the Early Neolithic can possibly be called the "Danilo A" phase. The motifs tend to carry on from the Tremolo Impresso types, but the appearance of incised spirals and spiral based motifs as well as geometric shapes can be found. Many of the motifs consist of parallel lines with connecting hatched incisions, herring bone incisions, double zigzag lines, and net or crosshatched motifs. Although direct cultural connections are not necessarily clear yet, numerous archaeologists have recognized that the later Impresso Tremolo phase tends to carry some of the motifs found in the earlier phase of the Middle Neolithic Danilo pottery. This has been recognized at a few sites with stratigraphic continuity from the Early Neolithic Impresso through to the Middle Neolithic Danilo, as seen at Škarin Samograd and Gudnja pećina, with evidence of Danilo A pottery at other sites such as Pokrovnik (Batović 1966: 86-88, 96-98; Chapman 1988: 8; Müller 1988: 231-232; Karg and Müller 376-377) and Vela spilja on Korčula (personal review by the author).

Impresso wares from the Impresso B phase onwards have been found at Gudnja pećina, on the eastern end of the Pelješac Peninsula. The site revealed a well stratified cultural deposit with both Early and Middle Neolithic ceramics (see Batović 1966: 96-98; Chapman 1988), but the excavations by S. Petrak (Dubrovnik Museum), from 1963-1964, have never been published. However, certain materials have been reviewed with permission from Petrak for analysis and ^{14}C dating. The impressed wares from the site are found in two separate levels, identified as I (Impresso B), and II (Impresso Tremolo-Danilo A transition). The isotopic dating of the materials from this excavation was conducted only recently (ca. 1987). Likewise, the two publications in which the pertinent isotopic data can be found give slightly different details between the ceramic chronologies and the actual corresponding ^{14}C dates (cf. Chapman 1988: 7 *versus* Müller 1988: 231). In any case, the dates have once again been recalibrated with the more recent bidecadal curve, and have been illustrated with the general corresponding details which stand firm, regardless of the aforementioned references (see fig. 24).

As briefly mentioned above, the most important aspect of this site is the apparent continuous ceramic material which exists between the later phase of the Early Neolithic Impresso and the standard Middle Neolithic Danilo wares. The Danilo pottery is usually found either painted (with numerous localized variants) and often dark burnished. Evidence of this type somewhat negates an "Early Neolithic to Middle Neolithic" descriptive label since it would appear that a continuum is obvious in the pottery. Likewise, farming of some sort was more than likely practiced from the 8th Millennium BP (Chapman and Müller 1990) which appeals to a continuum view rather than the punctuated equilibrium-type framework that ceramic chronologies tend to suggest.

The extensive excavations conducted at Škarin Samograd (e.g. Batović 1966, Müller 1988: 219-235) are equally vital to the understanding of the Dalmatian Neolithic procession. The A, B, and Tremolo phases of the Impresso Neolithic are fully represented (Samograd II), along with the later Impresso-Danilo A wares (Samograd III). Once again, this evidence suggests a continuum of both motif and cultural development.

Perhaps a more intriguing aspect of this site is the presence of Early Neolithic monochrome wares (Samograd I). Until this evidence was uncovered, this type of pottery was unknown on the Dalmatian Coast. Numerous coastal sites across Greece have well documented monochrome ware phases, including the well published cave site known as Franchthi (Jacobsen 1969: 361-363; 1973: 258-263), with monochrome evidence even stretching out to the island of Korfu, at the site of Sidari (Sordinas 1967, 1968, and see fig. 27). Just over the Dinaric Alps, in northwest Montenegro, is minor evidence from Odmut cave in Level IIa, where a "few fragments of fine monochrome earthenware with a red burnished slip" associated with Impresso pottery were revealed (Marković 1974: 8). This description matches the aforementioned Franchthi Cave and Škarin Samograd pottery assemblage. The implications of these monochrome finds and maritime/ coastal connections will be discussed later in the thesis.

Until the late 1960s, the best documented Impresso assemblage was the site of Smilčić, situated ca. 21 kms. east of Zadar (Batović 1966). The site is ca. 6 kms. from the sea at the nearest point (Novigradsko more), and is situated in agricultural lands near the Zadar headlands. The materials from the site spans from the Early Neolithic Impresso, through to the Middle Neolithic Danilo, although the bulk of the cultural materials are from the latter. There are a few Early Neolithic sherds which have characteristics of the Impresso A phase. However, as stated above, this simple one-notched motif tends to linger into the B and Tremolo phases, so it is not entirely clear if the site actually has what can be called an "A Impresso" phase.

The B phase is clearly apparent in the materials illustrated by Batović (1966: plates XXVI-LXXVI), as is the Tremolo phase. Some sherds can be identified with characteristics of the Danilo A phase (incised net motif, hatchure-filled geometric shapes). Batović's own assessment, which describes both discreet and subtle local evolution of the Impresso at Smilčić (op. cit. 244), suggests minimal outside influences. The site is also important to Early Neolithic studies along Dalmatia, not only because of its status as an open air site, but also because it is the only Early Neolithic site, besides Tinj-Podlivade, with clear evidence of a settlement. Hopefully the materials, which have not received proper isotopic dating, can be further analyzed. In any case, the pottery

clearly corresponds chronologically to the Gudnja pećina and Pokrovnik sites which both have ^{14}C dates in associated.

The Danilo-Bitinj site[14], recognized as the type-site for the Middle Neolithic Danilo Group (Korošec 1964), revealed Early Neolithic cultural materials as well, although the context was not terribly clean (Batović 1966: 91-92, 227-228). The few fragments found appear to fall into the Impresso B phase, with Tremolo Impresso also represented in the sample. Batović points out that one of the finds appears to be similar to the later phase of the Impresso Neolithic from Smilčić (ibid.) which would of course correspond to Müller's Early Neolithic "Danilo A" phase (1988: 231).

The cave site of Gospodska pećina, and the open sites of Nin and Brebir, have also documented early Impresso phases. At Gospodska pećina, radiocarbon dates from a hearth associated with the Early Neolithic Impresso pottery has been dated to 7010±90 BP, uncalibrated (Malez 1979: 5-11; and see fig. 26 for recalibrated dates).

At the open site of Nin, located near the shoreline north of the coastal town of Zadar and only 27 kms. distant from Smilčić, 146 sherds of pottery were collected with approximately two thirds of the fragments clearly from the Impresso A phase (Batović 1961: 12-16; 1965b; 1966: 84-85, 226). Most are found with the muscle lip impressions, and one fragment also has the telltale Cardium stamp, as well as a reddish-white encrustation in the impression. Zigzag motifs from the lip of muscle shells prevail in the sample and as Batović notes, the composition is the same as the motifs found on the Smilčić Impresso wares (1966: 85). Other variations include rhomboid motifs and standard impressed and slightly incised bands. *Bos* (species unknown) and ovicaprid bones, mostly sheep, were found at the site as well one milling stone (pestle).

The site of Brebir is located at the junction of two small brooks that drain from the Velebit section of the Dinaric Alps. Cultural material had slumped down from erosions that revealed at least 4 cultural horizons and evidence of compact earth, possibly from house structures[15]. The ceramics and the few lithics are identical to those from the earliest phase at Smilčić. Once again, Batović has noted that the some of the later fragments appear to have hints of the Danilo designs (op. cit. 89-90, 227), but unfortunately, not much more is known about this site. The compact house flooring (if these strata are actually living surfaces) associated to the Early Neolithic is quite a rare find on the Dalmatian Coast so hopefully this site will be re-investigated in the future.

On the extreme western end of the island of Hvar is a cave known as Markova špilja. The cave is very close to the sea shore in a geographic situation very similar to that of Vela spilja on Korčula. The cave had seen a few amateur expeditions, but in 1955

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[14] See Chapter 4, section 10, for further information concerning the ethnobotanical finds at *Danilo Bitinj*.

Novak took over systematic excavations at the site (Novak 1959; 1961a; 1962; 1967; 1968). The Early Neolithic materials from the site consist of pottery from the A, B, and Tremolo phases of the Impresso pottery. Middle Neolithic pottery of the so-called Danilo-Kakanj-Ripoli complex was also found, as was Late Neolithic Hvar Culture materials. There are some very tricky questions regarding the stratigraphy in the cave. Novak reported that Late Neolithic Hvar material was found underlying the Danilo phases, with the implications that the former must at least pre-date the latter (1962: 141-142). Clearly, some type of disturbance must have occurred. Other caves with firm continuity from the Middle Neolithic through to the Late Neolithic Hvar Culture illustrate that there is no possible way the Hvar Culture can pre-date, or is contemporaneous with, the Middle Neolithic (see Chapter 5; Vela spilja and various Čečuk references).

Recent excavations at the Tinj-Podlivade site, near Zadar, revealed an Early Neolithic settlement site (Chapman et al: 1990) Once again, a recalibration of the dates has been performed for this thesis (see fig. 26). As mentioned in Chapter 4, the excavations produced a few carbonized remains of barley, einkorn, and emmer wheats, with the wild variant Triticum boeoticum also present (op. cit.: 34). Chapman points out that the subsistence economy of this site suggests a completely evolved mixed farming economy rather than a transitional phase towards full domestication (op. cit.: 37). The faunal remains are overwhelmingly ovicaprid (85%+), with a small percentage of cattle (ca. 5%) and an even smaller percentage of pig, "other domestics", and various wild species such as roe deer, red deer, and badger (op. cit.: 35-37). In general, the faunal assemblage resembles Smilčić (Schwartz 1988: 45-75). Along with the varied terrestrial faunal assemblage, numerous types of marine mollusks, such as mussels, oysters, topsells, and murex, were found, which add to a very broad based economy (Chapman et al 1990: 35-36). Preliminarily, these finds closely resemble the assemblage from Korčula's Vela spilja, although detailed studies have yet to be conducted at the latter site.

The pottery found at the site is of the Impresso-type, with both cardial impressed wares, as well as those with non-cardial shell impressions, stick, finger, and bone impressions, and finely serried stamped patterns (op. cit.: 37). In terms of the system set out by Müller for the Impresso of the Dalmatian Coast, these finds are probably from Impresso A and B group typologies. The radiocarbon dates (fig. 26) are more or less consistent with the dates from Gudnja pećina, and contemporaneous with the Odmut

[15] The materials were never published but the artifacts are currently stored in the town of Bribir and the *Arheološki muzej, Zadar.*

Level II and Gospodska Pećina dates (Chapman 1988: 7; Marković 1974; 10; Srejović 1975: 3-12; Malez 1979: 5-11).

The connection eastward, over the Dinaric Alps into Montenegro and Herzegovina, cannot be overlooked, specifically since finds from a few sites in the immediate hinterland show that contact to the coastal areas was not infrequent. While diagnostic Starčevo[16] pottery in the South Dalmatian context is non-existent (Batović 1966: 232), there are these inland sites with some connections to the Adriatic. The aforementioned Crvena Stijena in Crna Gora (cf. Benac 1957a: 25-44; 1958; Malez 1970: 6), along with the cave of Zelena pećina (Benac 1957b:), in western Herzegovina, both have the Adriatic Impresso ceramics. At Crvena Stijena Level III, the materials lie just above the Late Mesolithic Level IV, but the transition phase is not clear, partly because the various Impresso wares appear to be from later phases. The shell impressions on some of the pottery is not specifically dominant. Likewise, Batović points out that sites which are further from the current and palaeo coastlines tend to fewer examples of muscle shell or Cardium shell impression technique (Batović 1966: 107-110, 231-232). In any case, the pottery assemblage tends to have more Adriatic Impresso qualities than Starčevo typologic features. The pottery and use of ground-stone tools, specific to this site, prompted the assemblage to be called the "Crvena Stijena Culture" (Alexander 1972: 38). However, the materials at the site do not necessarily reflect new, separate, or unique, culture aspects as such, and therefore references to an actual Crvena Stijena Culture should be used with reservation.

The stratigraphical situation at Zelena pećina is quite good. It would appear that the Early Neolithic Impresso wares in this cave pre-date the Early Neolithic finds in Crvena Stijena (within the parameters of the Adriatic Impresso chronology), although there are many similarities between the finds from the two sites. Stylistically, the pottery has a closer connection to Smilčić and the Dalmatian Coast Impresso, but certain features, such as white encrustation in the impressions, have connections across the Adriatic on the islands of the Tremiti, and even further towards southern Italy (Benac 1957b in Batović 1966: 108, 232). Furthermore, pottery pinch-mark impressions, grass-spike impressions, and barbotine decoration give connections to eastern Serbia and Romania, and the respective Early Neolithic Starčevo-Cris-Körös complex[17] (e.g. Kutzián 1944, 1947; Garašanin 1954; Galović 1968; Bruckner 1968; Letica 1968). The situation in Zelena pećina appears to be a mixture of the eastern and western styles (Benac 1957b: 72-74), which would naturally imply very broad cultural contacts.

[16] The Early Neolithic east of the Dinarics, mainly focused in Serbia, Romania, Hungary.
[17] Yugoslav-Hungarian-Romanian variants of the Early Neolithic, receptively.

The aforementioned Odmut cave has a few Early Neolithic strata that deserve some mention. As the map on figure 32 shows, Odmut lies over the southern end of the Dinaric Alps near the banks of the river Piva. The level identified as II (Odmut IIa and IIb) contains the Early Neolithic materials. A particular interesting quality of the deposit is the presence of the Starčevo materials (monochrome wares, barbotine technique, "tongue-shaped" axes of polished green flint) in Odmut IIa while Adriatic Early Neolithic Impresso wares similar to Crvena Stijena Level III and even more directly Smilčić, are well established in Level IIb. Since the Adriatic Early Neolithic materials are much more numerous in Level IIb, it has been suggested that the inland cultural sphere was more influential in the earliest Neolithic occupations in the cave, while towards the end of the Early Neolithic, the inhabitants of the cave were more inclined towards the Adriatic cultural web (Marković 1974: 10). This observation also reflects on the situation previously outlined by Batović in Crvena Stijena and Zelena pećina (1966: 232).

A brief overview of the Early Neolithic scene on the far north coast of Dalmatia should be mentioned. The caves Vela spilja on the island of Lošinj, Jamina Sredi on the island of Cres, and Vorganska peć on the island of Krk all have evidence of either Impresso A or B pottery (Mirosavljević 1962: 175-204; Benac 1961: 70-71; Batović 1966: 107, 231, and T I-TII; Müller 1988: 220; Müller 1994: 314-316). Farther north above the Pula Peninsula near Triest, the sites of Caverna del Pettiroso and Grotta Azurra have evidence of Impresso A pottery (Müller 1988: 220; Korošec 1960: 13-14 in Batović 1966: 107). Unfortunately, the northern coast of Dalmatia suffers most from a lack of archaeological research into the Early Neolithic. Most of the sites are very poorly documented and there are minimal examples of the finds in the literature.

Towards the south, Müller has pointed out an Impresso A site in northern Albania know as Blaz II (Prendi and Andrea 1981 in Müller 1988: 220, 235). This is perhaps the first evidence published on the Early Neolithic of Albania in recent times and possibly breaks the ice of Albanian Neolithic archaeology; a silence Bray lamented more than three decades ago (1966: 106).

Further south, on the northern end of the Greek island of Korfu, some very interesting yet often overlooked data has come out of the excavations at the site known as Sidari (Sordinas 1967: 64; 1968: 392-424). The Impresso pottery found at this site is reportedly similar to the materials from Crvena Stijena Level III, Zelena pećina (3rd stratum), and the Grotta della Mura, situated on the southeast coast of Italy in the Puglia province (Sordinas 1967: 64). The published date of 7340±180 BP obtained from ash and charcoal (ibid.; GXO-772, see fig.27) is slightly earlier than those from Gudnja, Odmut II, and Gospodska pećina. Numerous suggestions have since been made which

support the notion of a north and westward spread of Impresso pottery from Greece (e.g. Chapman 1990: 37; Whitehouse 1969: 277).

6.4 Early Neolithic on the Periphery Islands in the Adriatic Basin

Before moving across the Adriatic to the Italian coast, it is appropriate to detail the finds from the periphery islands in the Adriatic. Most of these islands such as Palagruža are quite small, but recent research on these remote stations has shed light on the extent of prehistoric trans-Adriatic travel, contact, and trade, including mid-Adriatic resource exploitations.

Recent excavations on the Croatian island of Vis, in the remote cave known as Krajicina spilja (Kaiser and Vujnović 1995: 30-36), have exposed evidence of an Early Neolithic presence. While most of the finds dated to the Bronze Age, one body sherd of a Cardial impressed pot was recovered in the cave[18]. Only five lithics were found, but the interesting point to note is that two of the blade fragments appear identical to the recent chert outcrop discovered on the small and distant Adriatic island of Palagruža. As noted by Kaiser and Vujnović, Vis has no significant chert sources, and the nearest possible source would be the quarry found on Palagruža (op. cit. 34). Although the excavations were not extensive due to the nature of the research objectives, it is clear that the cave had some sort of associations with Early Neolithic maritime travels around the Adriatic, with possible connections to the chert quarry on Palagruža.

The Croatian island of Palagruža geographically consists of two small islets known as Mala Palagruža and Vela Palagruža (small and big Palagruža). The islands are actually closer to the Italian coast than the physical Croatian coastline. Within the last century, the islands were incorporated into the former Yugoslavia and are currently within Croatian national waters. The islands appeared in the literature by the late 1800s (Burton 1879: 151-191; Marchesetti 1876: 283-306), mainly with geographical exploration as the focal point, and until recently, only one main archaeological reference existed (Petrić 1975).

A point that will be discussed later but introduced here is the visibility to the these small islets from the other Croatian islands. Plate 3 illustrates the ability to see Palagruža on a clear days from a higher elevation on Korčula (photo taken from prehistoric hilltop structure KC-003). An examination of the general map of the Adriatic Basin will clearly illustrate the apparent remote position of Palagruža. However, the viewshed to these islets serves to reinforce the visual connections (with numerous archaeological implications), that would have been possible across the Adriatic in prehistoric and protohistoric times.

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[18] Other finds included lithics and 4 fragments of Late Neolithic Hvar Culture pottery.

During 1993, the Adriatic Islands Project[19] conducted a ten day research expedition to the island (Forenbaher et al. 1993: 37-45; Kirigin 1995: 61-66). Four Early Neolithic Impresso sherds, along with numerous flint artifacts (core preparation flakes, blades, debitage), were recovered from surface survey and several small soundings on Vela Palagruža. The Impresso sherds are stylistically linked to the Impresso A phase (Tim Kaiser pers. com.), so it is rather interesting to note that the Tremiti islands off the Italian coast revealed similar finds associated with Early Neolithic settlements. The artifacts comprise the first hard evidence of Early Neolithic, trans-Adriatic travel (as opposed to coastal navigation). Therefore, these finds supply direct evidence that Early Neolithic cultures in the Adriatic Basin had the technological ability to conduct extensive, open-seas, travel.

The flint quarry discovered on the smaller island, Mala Palagruža, is equally intriguing. Given the overall lack of lithic sources on the Central and South Dalmatian islands, the presence of a lithic source on such a strategically positioned island is extremely suggestive (Forenbaher et al. 1993: 43). Although the lithic materials were mentioned many years prior by Burton (1879: 185-186), it is only the recent investigations which exposed the archaeological connections. A few of the lithic finds from Korčula appear to be of the same material when color, grain, and cortex, are compared. Likewise, the aforementioned finds from the island of Vis, in Krajicina spilja, preliminarily compare as well. It is clear that the implications of these finds, regarding cultural contacts in the Early Neolithic, are very important.

The Tremiti are a group of islands off the Italian coast, situated just under 30 kilometers north of the Promontorio del Gargano (see fig. 32). Although the palaeo-coastline and its former relationship to the Tremiti is not well illustrated, it is clear from its geographic location that this position would serve as a primary contact point for trans-Adriatic travel and coastal trade. The main island of San Domino has had excavations at the Impresso A settlement site of Prato Don Michele (see Müller 1988: 220, 233-234; Whitehouse 1969: 274-276, 306) and Batović has even suggested that the Impresso A pottery from Markova spilja on the island of Hvar appears to have some striking similarities to these Tremiti finds (1966: 95, 228, 244). The Prato Don Michele site, along with the Cala Tramontana settlement with associated cemetery, Cala degli Inglesi surface site, all suggest that this station on the Italian coast, adjacent to Dalmatia, must have been quite active during the Early Neolithic[20]. Coupled with the

[19] The team consists of members from the Royal Ontario Museum in Toronto, Canada, the Archaeological Museum in Split, Croatia, the Centre for the Protection of Cultural Heritage of Hvar, and the University of Birmingham.

[20] The brief references for these sites are mainly by F. Zorzi (1953, 1955: 157, 1958: 208, 1959: 320); and O. Cornaggia Castiglioni (1967: 448), with a more complete archaeological description of the Tremiti by A. Palma di Cesnola (1967: 349-391).

recent Palagruža finds, the Tremiti islands form an important link in trans-Adriatic contact.

Radmilli has also pointed out the scant but nevertheless important connections between the Tremiti, Palagruža, and the Dalmatian Coast, possibly via the island of Lastovo (figs. 2 and 32). He mentions Bernabo Brea's hypothesis (1958; in Radmilli 1970: 440-441) that Early Neolithic cultures might have crossed over from Italy to Dalmatia (or *vis versa*) by bridging the islands of Lastovo, Palagruža, Pianosa and the Tremiti. Radmilli mentions a few lithic blades and three retouched scrapers collected on Palagruža (last seen in the Split Museum), but states that they could not be from the Upper Palaeolithic because the channel would have been "too wide" to be crossed by those peoples (1970: 440). However, in light of the recent Early Neolithic finds on Palagruža, plus the radiolarite (chert) quarry on Mala Palagruža, this theory is somewhat antiquated. Palma di Cesnola points out that Zorzi excavated numerous scrapers and tranchets of possible Upper Palaeolithic origin (Palma di Cesnola 1967: 354-355, 391), which could have connections to the Palagruža finds Radmilli mentions. In any case, a review of the Neolithic finds from the Tremiti, mainly from San Domino (*op. cit.* 349-391), reveals the extent of this island's prehistoric occupations and the obvious connections to assemblages from the Dalmatian Coast.

A final note concerning the survey of the Croatian islands should be made. While the "outer" islands such as Palagruža and Vis have had survey and excavation, numerous other islands which might hold vital archaeological evidence have yet to be explored. The aforementioned island of Lastovo has had little research since Radmilli's excavations during the Second World War, when Lastovo (Lagosta), was under Italian control. It is unfortunate that Radmilli claims the diary of the excavations in the cave, known as Grotta di Gambero (Gambero Cave), was lost, and that "due to the action of humidity the writings showing the origin of the materials were illegible" (Radmilli 1970: 442).

An island south of Korčula, known as Sušac, is relatively large (see figure 2), but due to the fact that there are no permanent settlements on the island, logistics have always been quite problematic. However, there is one light house on the island that can possibly be used to house a research team. Permission has been granted to the author to conduct a preliminary survey. Hopefully, this will shed even more light on the extent of inter-island and trans-Adriatic trade.

6.5 Early Neolithic: The Central and Southern Italian Adriatic Coast

There are probably close to 100 Early Neolithic sites in southeast Italy, most of which are not well published or only referenced in local journals. A general overview of the entire Neolithic pottery sequence can be found in Whitehouse (1969), but it is

unfortunate that more recent and accessible studies do not always cover other aspects (resources, faunal and floral aspects of the "settlements", etc.) of the Early Neolithic occupations of the Italian Adriatic coast.

Observations of the general trans-Adriatic Early Neolithic trends were briefly discussed in the mid-1960s by both Batović (1966: 125-136) and Bray (1966: 100). Likewise, it was later suggested that the origins of the south Italian Impresso Ware should be connected to the Dalmatian Coast or western Greece (Whitehouse 1969: 277). In light of the aforementioned recent discoveries on the island of Palagruža, it would appear that this could be one possible scenario. So, although there has yet to be a quantified physical examination of the associated materials from both sides of the Adriatic, it is apparent that the hard evidence for Early Neolithic trans-Adriatic connections are beginning to take shape. The brief overview below only covers those sites that are specifically relevant to the current line of discussion.

Radiocarbon results from the coastal site of Coppa Nevigata indicate Impresso A occupations as early as 6200 BC (uncalibrated), although this date still falls under much scrutiny[21]. Likewise, other coastal sites such as Romagna Misano Adriatico, the Grotta del Guardiano, the Grotta della Mura, and Torre Sabea all show firm evidence of Impresso A pottery associated with the sites (Müller 1988: 220). Later Impresso dates from the A, B, and Tremolo phases are found at the Grotta del Santuario della Madonna with a 5605± 85 BC date[22], the San Vito-Foggia settlement site (5050±100 and 4590±65 BC; uncalibrated)[23], the Maddalena di Muccia settlement site (4630±75 BC, R-643; uncalibrated), Leopardi-Penne di Pescara settlement site (4610±135 BC, Pi-101; uncalibrated) (Guilaine 1979: 22-23), and the Grotta dei Piccioni site with a 4297±130 BC uncalibrated date (Radmilli 1962: 35-41, 56 and 1963: 141 in Bray 1966; and Bray 1966: 100-101, 106).

6.6 The Middle Neolithic of Dalmatia and Connections to Italy

The Middle Neolithic along the Dalmatian Coast is quite problematic. While trends within the stratigraphies of a few well excavated sites are somewhat clear, there are numerous aspects of the finds that are still quite vague. Unfortunately, the literature is somewhat thin regarding the East Adriatic Middle Neolithic and therefore the following discussion will reflect this fact. As the following discussion details, a few connections do extend eastwards over the Dinaric Alps and into the interior Balkan regions. However, the Middle Neolithic of the Dalmatian Coast, recognized as the Danilo Culture, has better parallels with southern Italy and western Greece and

[21] Sample tested at the labs in Pisa, no lab number attached, for 6200 BC, as published by Guilaine (1979).
[22] Ri 285 (Rome or Pisa labs) uncalibrated, as published by Guilaine (1979).

indicates the tendency for sea-borne contacts throughout the region (Alexander 1972: 43).

6.6.1 The Middle Neolithic of Dalmatia

One of the major problems in defining the so-called Middle Neolithic of the Dalmatian Coast is the question on when it actually begins. The scenario put forward by Alexander, that the Middle Neolithic Danilo Culture could be from an immigrant population to the Dalmatian Coast (ibid.), is not very well supported in the archaeological record. The evidence for this view is based solely on similarities between ceramic motifs. Such observations are completely premature and somewhat outdated, although his "sea-borne contacts" theory does hold up and will become more clear later in this section. Another contemporary observation was that there were varying amounts of so-called "sterile layers" on most Impresso sites, between the later Impresso phases, and the appearance of the Danilo Wares (Tringham 1971: 104).

The latter approach implies that the regional populations just disappeared for a millennium or so and came back later with new pottery and a few different lithics in the tool kit. At numerous sites previously discussed such as Gudnja pećina, Škarin Samograd (see Chapman 1988: 8), or Pokrovnik (Müller 1988; Karg and Müller 1990), there is both stratigraphic and ceramic evidence which indicate continuity of the Early Neolithic to the Middle Neolithic. As mentioned, supportive finds possibly come from strata at Danilo-Bitinj, Nin, Brebir, and Vela spilja on Korčula. So, although in some cases the occupants might have left the site, they certainly did not pack up and leave the region. Localized transformations of the later Impresso Wares are evident in numerous motifs, which are clearly proto-Danilo (e.g. spirals, hatched triangles, herring-bone, and rhomboid patterns; see fig. 34 and cf. Müller 1988: 232). Therefore, the most solid physical evidence now points towards a slow transition of the later Impresso Tremolo phase through the Danilo A Phase and into the "classical" Danilo assemblage.

The best dates that can be offered for the Danilo Culture are from the unpublished cave site of Gudnja pećina[24] and the materials dated at Pokrovnik I (Karg and Müller 1990). These dates have been re-calibrated for this thesis using the more recent bidecadal high precision curve and offer the only reliable isotopic dates for the Middle Neolithic of Dalmatia (see figs. 24 and 28).

The Middle Neolithic of the Dalmatian Coast is typified by the ceramics associated with the Danilo Culture (cf. Korošec 1964). The Danilo "type site" is an open-air settlement found at the location known as Danilo-Bitinj, northwest of the coastal

[23] Late Impresso materials found at the site (Tremolo Impresso); dates obtained from the lab in Pisa, no lab numbers associated, as published by Guilaine (1979).

town of Split. The site is situated near a natural spring known as "Bitinj" which could have been active during the occupation (op. cit.: 89). The Danilo-Bitinj site was not extensively stratified, with little more than 20-30 centimeters of deposit. However, it appears as though the immediate area was consecutively occupied by this Middle Neolithic group. The site revealed evidence of ca. 24 small huts or houses that were partially paved[25]. Barbed and tanged projectile points appear for the first time, and 8 fragments of obsidian debitage were also recovered. The pottery from the site can be divided into two general groups, either painted or burnished and incised, but a more detailed description of the typology will follow below.

One fragment of diagnostic Impresso pottery was found on the Danilo-Bitinj site and Korošec states two possibilities for the presence of this sherd. The first is that the Middle Neolithic Danilo site is above or very near an undiscovered Impresso site. Alternatively, the sherd's presence was hypothesized as an import. However, he states that this says little when there is only one sherd to examine (op. cit. 94). This latter point would imply that the later Impresso Wares and the early Danilo Wares could be contemporaneous, and Korošec believes that this would mean the Impresso pottery was imported from a contemporaneous cultural group possessing pottery other than the Danilo type ceramics. The other theory put forward by Korošec is that there is no continuum of the Early Neolithic Impresso, but perhaps an "imitation" Impresso sherd from an "imitation" Impresso vessel has been found. In any case, Korošec believes that the Danilo chronologies should be seen to begin from the earliest phases at Danilo-Bitinj, with possible links to the aforementioned Smilčić (Batović 1966) which seems to have the so-called Danilo A ceramic evidence. The point of mentioning this evidence is to illustrate the problems many regional author's had when stratigraphies, typologies, and chronologies come into even minor conflict.

Moving on, the descriptions of the Danilo typologies have changed quite a bit over the last few decades, but almost all are based on re-classifying known finds since the Dalmatian Middle Neolithic has yet to be fully examined. Alexander's view (1972: 44) is that they appear as:

1. Burnished and incised wares bearing meanders, spirals, and small dots, often encrusted with a red paint.

2. Painted wares such as pedestalled bowls with rim lugs or rounded and bluntly carinated cups. Many with a white or light-yellow slip and are painted with motifs such as wide bands or red panels bearing a fine black edge which are usually filled with various geometric patterns.

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[24] See Chapman (1988: 7) for the dates which were obtained with permission from S. Petrak of the Arheološki muzej, Dubrovnik.

[25] The Middle Neolithic phase at *Smilčić* showed evidence of two ditches surrounding the site which were no more than ca. 1.5 meters in height. The *Smilčić* site also shows more stratification of the Danilo Culture and therefore indicates cultural continuity throughout the Middle Neolithic (Batović 1966: 216-218).

Tringham classified the Danilo Culture wares into three groups (1971: 105). They are recognized as:

1. Course wares with large granular inclusions and decorated finger and nail impressions[26].
2. A hard, slightly finer ware than the previous which is polished and decorated with intricate incised spirals, cross-hatchings, and herring-bone designs which are often filled with white or red paint (encrusted) after firing.
3. Thin wares with very fine mineralogical inclusions fired to a light orange color and covered with a white slip. The surface is painted black with red patterns before firing and then burnished.

Meanwhile, Chapman has put the Danilo Wares into four typological fabric categories (1988: 11):

1. Dark burnished wares with or without incised decoration.
2. A red or buff monochrome ware.
3. A bichrome painted ware[27].
4. A basic course ware found in varying colors.

Clearly, the Danilo ceramic descriptions seems to have some variations. Tringham's overview tends to take in many aspects of pottery with eastern connections with the Vinča Culture and while the connections are apparent, certain descriptions, such as number 1, do not seem to apply to the standard Danilo Wares. Alexander's descriptions can serve as a general overview of the materials, while Chapman's seems to be a bit more flexible with the typology. The full range of the Danilo assemblage tends to be taken into account by Chapman and therefore, this typology is preferred.

Other ceramics types found in the Danilo assemblage are the clay stamp-seals and anthropomorphic clay models, many of animal's heads, and the so-called "cult vessels" or salt-pots (cf. Korošec 1964; and Chapman 1988: 14) which appear as "four-legged vessels (see fig. 35) with large mouths set obliquely and massive ring handles" (Tringham 1971: 105). These will be detailed later in section 6.6.2. The Middle Neolithic Danilo Wares are generally found throughout the same regions in which the Adriatic variants of the Early Neolithic Impresso wares appeared. However, some Danilo finds are known from the western side of the Drina River. Otherwise, the bulk of the archaeological evidence clearly indicates that the focus of the Danilo Culture was west of the Dinaric Alps, along the Dalmatian Coast, extending to the adjacent islands, and at a few spots on the Italian side of the Adriatic.

The general origins of the burnished wares might parallel the central Balkan transition from fine painted wares to burnished wares. The assemblage tends to reflect

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[26] Either Tringham is describing a Danilo-A type, which would be the transitional wares described earlier in this chapter, or Danilo derived variants found in eastern Balkan assemblages. These variants to not appear to be specific to most Dalmatian assemblages.

[27] In some cases, trichrome painted ware is also evident-(author's emphasis).

the general typology of shapes known from the site of Kakanj, in Bosnia (Chapman 1988: 11). However, Benac points out that the decoration of the Kakanj and Danilo ceramics are strikingly different (1973: 410). The latter point would naturally imply that the Middle Neolithic Danilo Culture is a localized stylistic variant of a basic regional typology.

This process of stylistic development within different cultures has been discussed by numerous authors concerning the Neolithic of the Adriatic Basin (cf. Bray 1966: 106; Guilaine 1979: 29; Čečuk 1986: 47; Chapman 1988: 20). Excavations at Korčula's Vela spilja have further confirmed these cultural variations. The Middle Neolithic horizons of Vela spilja yielded numerous fragments of standard wares from the so-called Danilo-Ripoli-Kakanj Complex. However, many of the painted wares which Čečuk tentatively calls the Vela Luka Culture have distinct analogies with the unpublished assemblage known from Gudnja pećina, on the nearby Pelješac Peninsula (1986: 46-47), reinforcing the theory of a localized variation of Danilo.

6.6.2 The Dalmatian Middle Neolithic: Connections to Italy and Greece

The painted wares of the Danilo seem to share striking stylistic similarities with a ware found at numerous Middle Neolithic sites across the Adriatic. The coastal site known as Ripoli, in the Abruzzo province, has a painted ceramic recognized as Ripoli Trichrome Ware. The motifs are usually geometric hatched patterns, which have been painted in by fine black or brown lines. The wares are often found with two parallel lines enclosing a row of dots which bands the geometric patterns. A reddish (or orange-red) background is often applied behind the panels of these motifs. The Ripoli pottery is very similar in style to those known as Capri Trichrome Ware, with the best stylistic examples from the island of Capri, in the Grotta delle Felci site (Whitehouse 1969: 284). Likewise, the south Italian regional wares known as Lipari Trichrome and Apulian Trichrome also share a common motif range that is similar to the Ripoli and Capri wares. Out of these groups, it is generally the Ripoli Trichrome Wares that appear to have direct similarities with the Danilo Wares.

However, another group found on the Italian side of the Adriatic that should be mentioned is that of Serra d' Alto. Although this group is normally not mentioned in the discussions concerning Neolithic contacts with the Dalmatian Coast, fragments of Vela Luka Culture pottery from Korčula definitely warrant an overview.

The fabric in the Serra d' Alto Wares is usually described as fine and hard with a creamy buff or pinkish surface. The materials are painted with various geometric patterns in a dark purple-brown paint. The motifs include complicated designs based on solid triangles, often combined with cross-hatched geometrics, meanders, or spirals. A

bordered zigzag is probably the most common motif, often used as a margin for patterns, along the lips of vessels, or as an isolated motif unto its own (op. cit.: 287).

The connections to Serra d' Alto motifs have not been overlooked from the Dalmatian archaeological viewpoint (cf. Alexander 1972: 43; Bray 1966), but there is a general lack of quantified supportive evidence. Examination by the author of local variants of the Danilo painted pottery found in Korčula's Vela spilja[28] has revealed at least two fragments with clear connections to the Serra d' Alto Wares. One rim and body sherd has a banded zigzag motif which runs across the lip of the vessel, while another body sherd has a stacked sub-rounded triangular motif which is clearly Serra d' Alto (Čečuk and Radić 1995: 22, pl. C34, 23; Bray 1966: 103, fig. d; Whitehouse 1969: 288-289, figs. 9-10).

Bray mentions evidence for trans-Adriatic pottery trade and contacts during the Middle Neolithic, albeit from Dalmatia to Italy. He points out that a few Danilo incised sherds were found in the same context as Capri Trichrome and Early Serra d' Alta wares during excavations on the island of Lipari, just off the north Sicilian coast (Bray 1966: 106). This connection, also emphasized by Chapman (1988: 13-15), might have direct cultural links to the incised Danilo Ware variants found in Korčula's Vela spilja.

Both Bray (1969: 287), and Whitehouse (1966: 103-106), speculated that the Dalmatian Coast could be the possible source for influences found in both the Italian Trichromes (specifically Ripoli Wares) and the Serra d' Alto Wares, so the importance of these finds within a framework of trans-Adriatic contact is quite relevant. Although the actual Serra d' Alto type-site is situated inland, there are more than a dozen coastal sites[29], including Molfetta and Cala Tramontana (on the Tremiti Islands), which contain the Serra d' Alta Wares. A glance at the map on figure 22 will illustrate the connections, both up the Italian Coast to the Tremiti and across the Adriatic. Likewise, Barfield (1981: 32-34) has briefly pointed out Serra d' Alto connections, both within Italy and across to the east Adriatic.

Čečuk has also discussed the similarities between bifacial flint points from the Cala Tramontana site, sites in the Gargano Promontory, and finds from the Dalmatian Coast; e.g. Markova spilja (Čečuk 1970: 87-104), although these are probably from earlier periods. The few obsidian finds from the Middle Neolithic phases at Smilčić and Danilo also suggest contacts with the southern Italian Pantelleria (Palmarola?) or Lipari obsidian sources (Bray 1966: 104; Tringham 1971: 105; Korošec 1964: 90, 94). Furthermore, four incised Danilo sherds were found in a house structure ("Hut 9") at the Ripoli settlement site on the Italian Adriatic coast (cf. Cremonesi 1965: 85; Bray 1966:

[28] The Vela Luka Culture materials are found in the Arheološki muzej, Vela Luka, Korčula.

101) while Ripoli Trichrome Wares without dotted motifs were discovered alongside incised Danilo Wares in Markova spilja on Hvar (Novak 1962: 19; Bray 1966: 105).

Finally, it should be noted that excavations in the cave known as Grapčeva spilja on the island of Hvar revealed Late Neolithic Sesklo-Dhimini B3 beta wares from Greece which are associated in Grapčeva with painted ware from the Hvar I phase[30] (Novak 1955: 328). So, while the Grecko-Italian connections are mostly based on speculation concerning the origins of various motifs, it is of interest to note examples found in Dalmatia, or what Bray calls the "intermediate area" between Greece and Italy (op. cit.: 314-328; Bray 1966: 105).

Another facet of the Danilo ceramic assemblage that has appeared elsewhere are the so-called salt pots (see figure 25). Almost all of the examples from Dalmatia are found well within the overall Danilo period. However, similar vessels are known from the Middle Neolithic of central Greece, specifically from Elateia (Holmberg 1964: 343-348; Tringham 1971: 105; Weinberg 1962: 158-209;) while (Chapman (1988: 13) points out that numerous "salt-pots" are known from Corinth and elsewhere in southern Greece (and see Phelps 1975 in Chapman 1988). Benac has shown that the vessels were around by the earliest phase of the Kakanj wares at Obre I, which is more or less contemporaneous with the earliest Danilo finds (1973: 384-385). A salt-pot fragment was also discovered in the excavations on the Italian island of Lipari in which Trichrome Wares and the aforementioned Danilo incised pottery were contemporaneous (Bray 1966: 104). Likewise, salt-pot fragments are known from Korčula, in the Danilo assemblage at Vela spilja (Čečuk and Radić 1995: 18; Radić pers. com.).

6.6.3 The Dalmatian Middle Neolithic: Overview of Floral and Faunal Remains

It is very unfortunate that there is minimal floral and faunal evidence that has been produced which allows a particularly in-depth investigation of the Middle Neolithic palaeo-economies west of the Dinaric Alps. Tringham mentions the presence of "sickle gloss" found on lithics associated with the Danilo Culture (1971: 105), but since no sites are named and given the fact that this aspect is rarely discussed elsewhere in the literature, this view should be seen as speculation. The few but often overlooked grain finds detected in the clay and mud hut foundations at Danilo-Bitinj show evidence of Emmer and Einkorn cereals, as well as the known wild variety *Hordeum vulgare* (Hopf 1964: 107-108, and Sl. 1-Sl. 2). However, the extent of cereal domestication, if any, is

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[29] The geographical regions recognized as the Tavoliere, Gargano Promontory, and Adriatic coastal strip (Whitehouse 1968: 335-336).

[30] The earliest phase of the Late Neolithic horizons noted by Novak in Grapčeva spilja is Hvar I . The wares generally have dark surfaces and are painted with red scroll and spiral patterns. It is likely that these materials post-date the examples in the current discussion, but it was noted at the *Pokrivenik* site on Hvar and at *Danilo-Bitinj* that the later Danilo wares mixed with the painted early Hvar I wares (Korošec, in Bray 1966: 105-106).

impossible to judge due to the unquantified nature of the finds and the associated problematic aspects brought up in the Chapter 4 discussion. The previously discussed cereal remains from Pokrovnik I are more or less contemporaneous with those from Danilo-Bitinj (see Hopf and Müller 1990), and even though this serves to reinforce the notion of fully domesticated crops in the Middle Neolithic of the Dalmatian Coast, the data set is still very limited.

Faunal remains associated with Neolithic sites west of the Dinaric Alps are not well researched. Schwartz (1988: 45) points out that the best regional assemblage used as comparison prior to the studies at Tinj-Podlivade (Chapman et al 1990) and examination of the Nin and Smilčić finds is from the Bosnian site Ober (Ober I and Ober II; Bökönyi 1974 in Schwartz 1988). Since this view covers the entire Neolithic, examinations of the Middle Neolithic economies will be quite limited.

Nin is an Early Neolithic site and so falls outside of the present discussion. The analysis of the finds associated with the Middle Neolithic occupations at Smilčić were conducted well after that materials were collected. Most of the finds were in storage and it is clear that the sample is by no means complete. Therefore, the analysis conducted can only serve as an overview to a Middle Neolithic Dalmatian assemblage (Schwartz 1988: 45-61). The majority of diagnostic bones are from domestic varieties consisting of cattle, ovicaprid, pig and dog. Wild varieties are also present in the form of roe deer, red deer, wild cattle, chamois, fox and rabbit.

It is interesting to note the wide variety of Molluscan remains from Smilčić (op. cit.: 57-61) The finds appear to parallel the assemblage from Vela spilja on Korčula regarding the numerous species present. However, the Molluscan finds run rather thin in the earliest phase of the Middle Neolithic at Smilčić. It is not clear as to whether these materials were simply not collected, collected and eventually discarded by the original excavators, or if they reflect changes in the available resources and subsistence strategies. Schwartz has noted that of the 17 different species found in the sample, most are bottom dwellers from the sands and muds of the shore and associated littoral zone. This contrasts with the 13 species represented in the Tinj-Podlivade site, located only 15 kilometers distant, where the sample is comprised primarily of Molluscan which live on hard substrata and rocks (op. cit.: 57). Even though this points towards differentiated resource exploitations at two sites within a similar catchment area, the finds from Tinj are associated specifically with the Early Neolithic while the Smilčić finds represent mainly the Early Neolithic and only a fraction of the Middle Neolithic period.

6.7 The Late Neolithic and Eneolithic of the Dalmatian Coast

The Late Neolithic and Eneolithic phases west of the Dinaric Alps can, in some cases, be seen as the least understood prehistoric periods of the Dalmatian Coast. Very

few articles have been published, and the majority of the information that has been put to print is mostly concerned with pottery typologies and chronologies. Once again it should be mentioned that there are currently no ^{14}C dates for the Late Neolithic of the Dalmatian Coast and adjacent islands. Although this situation should change soon regarding the Late Neolithic (Tim Kaiser pers. com.), the status quo is such that most of the chronologies are based on cross-referencing stratigraphical remains through seriation. Unfortunately, regional ceramic variations and the presence of supposed imports leads to the conclusion that without isotopic dates, the situation is highly problematic at best. The Eneolithic is covered slightly better than the Late Neolithic, at least regarding associated ^{14}C dates and the regional chronology (cf. Della Casa 1995; 1996), but there are still gaps in the coverage which have yet to be sorted out.

6.7.1 The Late Neolithic of the Dalmatian Coast

The Late Neolithic, like the previous Danilo Culture of the Middle Neolithic, is more or less confined to the coast and islands. There are no indications which would suggest evolution from the Middle Neolithic east of the Dinaric Alps (cf. Vinča Culture), although it is well known that Danilo pottery did occasionally reach the east (Benac 1971: 67-68). Therefore, at least judging by the motifs, it would appear that the Late Neolithic of the Dalmatian Coast evolved from the incised and painted wares of the Danilo Culture (Tringham 1971: 51).

The Late Neolithic of the Dalmatian Coast is usually recognized in the literature with associations to the Hvar Culture. This stems from the archaeological investigations of Grga Novak on the island of Hvar and the Late Neolithic materials uncovered over numerous campaigns. Most of the Hvar Culture typology and chronology is known from the extensive excavations by Novak in Grapčeva spilja (Cave of Grabak) from 1936 to 1953 (cf. Novak 1955a; 1959: 11-39)[31] , while significant evidence also comes from the Hvar caves of Pokrivenik and Markova (cf. Novak 1949; 1955: 331; 1962; 1967; 1968). Hvar Culture evidence has also been found in the Hvar cave known as Babina spilja (Benac and Garašanin 1971: 273-276)

The pottery has been divided into 5 different phases. However, it is clear that this is based partly on typology (motif) and partly on sequential position (chronology) in the various strata, so this should not imply that the Hvar Culture (or the associated wares) went through 5 distinct evolutionary "phases" as such. Generally, a basic incised pottery is found throughout the entire Hvar Culture assemblage and is usually detected at all coastal sites where the Late Neolithic is present.

[31] The excavations were interrupted by the Second World War, resumed in 1947, and continued annually from 1949-until 1953.

The fabrics of the all Hvar Culture Wares are extremely fine, with most painted or polished to varying degrees. Some of the wares are even covered in a reddish-brown, light-brown, or yellow paint that resembles more of a thin slip. The earlier trichrome phases of the pottery (I-II) usually have very dark (black-dark brown) surfaces and most appear burnished. Variants of the pottery are found covered in a brown, black, or reddish paint with a cinnabar-red band painted around the neck and shoulder of the vessel.

Spiral and scroll type patterns are often found painted on the pottery, usually in a dark red paint, and it is this motif which Novak points out as being indicative of the Hvar Culture (cf. 1955: 331; 1959: 30-31). The motifs are slightly reminiscent of the Danilo incised ware spirals, but only if that motif in itself is used as a parameter. Overall, the trichrome pottery with painted scroll and spiral patterns is unlike any of the pottery that immediately pre-dates the Hvar Culture (Bray 1966: 104-105). Concerning the origins of certain motifs and techniques, Novak even states that it would be useless to search for analogies elsewhere (1959: 27).

As mentioned in the last section, connections have been drawn between some of the Hvar I pottery and trichrome Sesklo-Dhimini AB 3 alpha and B3 beta Neolithic wares from Greece. Novak claims that the first occupants of Grapčeva were well acquainted with incised pottery and probably received influence from the Ionian or Aegean seas, hence developing the new styles (1955: 331). Novak is correct to point out the fact that the comparisons are only applicable if one focuses on the meanders and spirals but does not take into account the slip or the paint (1959: 28). A few sherds of the Dhimini pottery of the B3 beta type were also found in the lower levels of the Hvar Culture deposit in Grapčeva (Novak 1955: 328-332) and these of course lend support to the notion of contemporaneous contacts between Ionian and Aegean cultures and the Dalmatian Coast.

Bray reported that early Hvar I wares were found to be contemporaneous with the very late Danilo wares at Danilo-Bitinj and would therefore indicate a brief period of parallel development (Korošec, in Bray 1966: 105-106). However, all discussions concerning early Hvar Culture and parallel associations with Danilo are based almost entirely on speculation without much quantified or well provided evidence. It would probably be more appropriate to view the situation as an interface or transitional point in which the Danilo style motifs phase out and the adoption of the Hvar Culture motifs begins.

In any case, the red or black painted spiral motif becomes slightly more stylized in the Hvar III phase. Here, the painted motifs are found to be enclosed by incised lines that are in turn filled with white or red paint, depending on the juxtaposing colors

involved. Other motifs found in Hvar III are a "wave motif" and various mutations of the theme, plus some slightly more geometric based motifs. A few of the finds from Vela spilja on Korčula have a red-painted background with black scroll surrounded by white-filled incised lines. Phases IV and V are more or less the same as III, but a few of the vessels appear to be light brown or white slipped, once again with the red painted ornamentation.

The Hvar Culture materials are found in numerous locations along the Dalmatian Coast and adjacent islands. On the island of Lastovo in the cave of Gambero, Radmilli excavated Hvar Culture pottery associated with evidence of hearths, marine mollusks, land snails, and rabbit, deer, goat, and sheep bones (1970: 441). The soundings were quite preliminary, as the bottom of the Hvar Culture occupation was never reached. Likewise, it is perhaps important to note that Radmilli detected a "sterile" layer of sedimentation between the Late Neolithic Hvar Culture and the Eneolithic-Bronze Age strata (op. cit.: 442) which at least in descriptive terms, is very similar to the stratigraphical situation Novak noted in Grapčeva on Hvar (1955: 331).

On the island of Korčula, Jakasova spilja has been briefly examined and has revealed Hvar Culture occupations (Čečuk 1980), while materials viewed by the author from the cave at Samograd have clear Hvar connections[32]. In the well known Vela spilja (see previous chapter), well stratified Hvar Culture remains are found between the Middle Neolithic Danilo (and Vela Luka Culture) materials and the Eneolithic finds associated with the Ljubljana Culture[33]. Čečuk has suggested that some of the Hvar Culture pottery motifs in Vela spilja appear to vary somewhat from the Hvar island materials and has taken the time honored approach of suggesting another regional variant of the Hvar Culture (1986: 47).

Generally, the motifs are basically the same (Čečuk and Radić 1995: 24-33) even though alternate communities were living on both the islands of Hvar and Korčula during this period. As mentioned in the previous chapter, two in situ burials were found within the Hvar Culture levels at Vela spilja consisting of a ca. 36 year old female and a ca. 16 year old male. Materials associated with the individuals consist of standard Hvar Culture plain (undecorated) pottery and black slipped and polished Hvar pottery. The only other pertinent information which has been published concerns an arrangement of sea snails which were places around the cranium of one of the individuals at the time of burial (Čečuk 1986: 47; Čečuk and Radić 1995: 34-35). Since these are the only in situ

[32] Neven Fazinić from the town of Korčula has given the author a rim sherd of standard Hvar type which is painted black, polished, and has fine serrated impressions running perpendicular to the rim. The artifact is stored in the Arheološki muzej, Vela Luka.

[33] The pottery finds associated with the Eneolithic are assigned to the so-called "Adriatic variant " of the Ljubljanski Kultur.

Neolithic burials known from the Dalmatian islands, hopefully further analysis of the remains will be permitted.

6.7.2 Late Neolithic Faunal Evidence on Dalmatia

Like the Middle Neolithic, the Late Neolithic Hvar Culture is quite thin regarding published floral and faunal analysis. Novak (1955: 345-346) published a table of the terrestrial and marine fauna which were recovered from the excavations at Grapčeva spilja and this must serve as a general overview of the economies and resource exploitations of the Late Neolithic west of the Dinaric Alps. Since the materials were bulk-excavated, finds situated in the same "horizon", yet contextually quite distant, could be lumped together. Essentially, the assemblage will be loosely indicative of the Late Neolithic, but is by no means conclusive.

Most of the bones recovered were broken, which could indicate butchering or preparation of the meat within the limits of the cave. Large amounts of charred bones were recovered, which supports the notion of on-site preparation of the fauna for consumption. With the exception of a red deer horn and wild boar bones, the Late Neolithic assemblage consisted of domestics, mainly sheep and goat. Horse, pig, and cattle bones are present, but these are assigned to the later Eneolithic and Bronze Age occupations in the cave.

Massive quantities of shells were recovered at the levels where human activity was present. Novak summarizes the overall amount by stating that since the number of shells was so great, it would be superfluous to enter into details (op. cit.: 345). Among the numerous sea snails and shells found, specific note is placed on the *Murex brandaris* ("ugarac" in the local Dalmatian dialect) and *Patella caerulea* ("lupar" in the local Dalmatian dialect) as particularly targeted resources. Likewise, the meaty *Spondylus gaederopus* shells ("kopito" in the dialect from Vela Luka) were found throughout the Hvar Culture strata.

Remains from at least 5 humans were discovered in the cave (ibid.). This was determined mainly from the presence of 5 separate mandibles discovered throughout the various strata. However, no complete crania were found and most of the other evidence appears to be quite fragmentary. It should be stressed that no in situ burials, as such, were detected in Grapčeva.

Numerous bone artifacts were found in the Hvar Culture assemblage in Grapčeva. Most are rather crude and show no signs of polish or heavy use wear. A small quantity of whetted, polished, and well finished bone artifacts was revealed which included boring tools, needles (including a so-called "net needle"), an arrow or harpoon tip, and a small well-finished bone ornament which resembles a kind of stylistic toothpick and is of approximately the same size. These have also been discovered in the

Hvar Culture materials from Korčula's Vela spilja (e.g. Čečuk and Radić 1995: 27), but their function is not known. There is no evidence of use wear on the Vela spilja example, including the very tip of the "toothpick".

6.7.3 Lithic Materials of the Dalmatian Late Neolithic

Only ca. 50 lithic artifacts were collected from the excavations in the lower strata at Grapčeva. This aspect of the finds is quite peculiar, as the associated pottery evidence is rather large. This could naturally reflect on the nature of the activities that occurred within the cave. Another possibility could be related to the lack of lithic resources on the island, which in turn might be reflected in the poor lithic presence in the assemblage. Alternatively, the sampling methodology was based on archaeological techniques employed prior to and just after the Second World War, which might account for the lack of smaller lithic finds.

Four axes along and three hammers were discovered. Some are manufactured out of sandstone or limestone, which reflects on the poor available resources of the island, although Novak notes that some are made of a "petrosilex" (Novak 1955: 344). The blades and projectile points are all described as being of the standard type which appear in the Late Neolithic kits in the region (ibid.). These should be understood as retouched blades, burins, scrapers, tanged projectile points, and bifacial points. Likewise, small polished lithic pendants are known from Grapčeva with connections to similar finds familiar to the author from Korčula's Vela spilja[34].

A different situation is found at the nearby Hvar cave of Pokrivenik. Novak states that there is evidence of quarrying within the cave judging from "...numerous tiny pieces of flint..." found and the rather large amount of lithic tools (ibid.) present. However, the situation is probably not as conclusive as Novak implies. It is not clear as to whether the quarrying is of an actual chert or radiolarite outcrop or, more likely in regional karst cave formations, a semi fine-grained source of limestone.

A point to note from Novak's description is the presence of flint debitage. Unfortunately, the "...numerous..." description does not supply much detail, concerning either the extent of the debitage, or the exact type. This could indicate procurement of these lithic materials elsewhere, and raw source reduction within the cave. Unfortunately, other cave sites on the Adriatic Coast, including Vela spilja, do not have evidence of lithic reduction occurring on-site. However, this could be due to archaeological sampling techniques, rather than reflecting on culturally related activities.

[34] The small polished lithic pendant is on display in the Arheološki muzej, Vela Luka.

6.8 The Eneolithic and Bronze Age of the Dalmatian Coast

There are numerous archaeological problems associated with the transition from the Late Neolithic through to the Early Bronze Age on the Dalmatian Coast. Most of the these shortcomings eventually funnel directly into the Iron Age, so that many of the situations described in this section will still be pertinent in the Iron Age discussions. One problem, in bibliographic terms, concerns the general body of evidence in which inconsistencies, unclear stratigraphies, and outright confusion all play a major part in the few well documented assemblages. Forenbaher recently recognized that, in Central Europe as a whole, there are minimal radiocarbon determinations which are directly linked to well stratified pottery sequences in both the Copper and Bronze Ages (1993: 219). He stresses a situation all to common in Balkan Archaeology: many "specialists" of the Bronze Age do not even consider ^{14}C dating as a standard excavation procedure (ibid.).

The use of "metals" as a defining factor in the Bronze and Iron Ages of Dalmatia does not appear to be as temporally revealing as in other areas of the Mediterranean Basin. It has been noted that, on islands with no known metal resources - and with almost none to be found in the immediate geographic region - the number of metal artifacts related to these periods is quite rare (Gaffney 1992: 129). Therefore, delineating the archaeological record into "Bronze" or "Iron" periods is problematic and restrictive, and may well be highly inaccurate. Complicating the picture further, Novak pointed out that certain lithic materials found in Dalmatia can be associated anywhere from the Neolithic through to the Iron Age, thus rendering a firm diagnosis of materials impossible if they are not well stratified (1955: 305). Many fairly recent articles focused on the Dalmatian Coast illustrate the complexities of the pottery sequences and associated chronological problems. The current situation is such that, in some cases, the researcher might be unsure as to whether certain pottery found during excavation should be indicative of a standard Late Neolithic assemblage or a common a Copper Age assemblage (e.g. the Late Hvar Culture wares versus earlier Nakovanj Eneolithic wares; cf. Dimitrijević 1970).

Currently, there are at least three, and possibly four, so-called cultural groups which have been identified through stratigraphic and typologic studies of the Eneolithic and Early Bronze Age (EBA) of the Eastern Adriatic. The three major groups (Nakovanj group of the Pelješac Peninsula, the Adriatic variant of the Ljubljana culture, and the Cetina group), have been summarized in recent studies (Chapman et al. 1990: 39; Della Casa 1995: 568). Della Casa also includes a fourth group, the Dinaric group, based on finds excavated from the Velika Gruda burial mound in the Boka Kotorska (see fig. 32).

The Nakovanj group stems from a highland cave site on the Pelješac Peninsula, which bears the namesake of the group (Petrić 1976: 295-313; and see fig. 32). The pottery is stylistically and typologically identified by the channels that run vertically on the vessel, usually along the neck, shoulder, and body. Likewise, the pottery is almost always found with a highly polished and dark (black and very dark brown) appearance. The pottery has some stylistic connections to the black polished wares from the Late Neolithic Hvar Culture, and the presence of some these channeled wares in the later assemblages on Hvar at Grapčeva spilja (Novak 1955), Markova spilja (Novak 1959), and Korčula's Vela spilja (e.g. Gjivoje 1969: T II-9; and Čečuk 1989: 46; Čečuk and Radić 1995: 36, and F1), has caused some debate on the origins and nature of this regional, copper-using, cultural group (Dimitrijević 1970: 105-122).

The next group is recognized by pottery of the "Adriatic type", also known as the Adriatic variant of the Ljubljana Culture, with its type-site in the low plains of Slovenia (Čović 1983; Dimitrijević and Tasić 1971: 300-302). The pottery usually bears excised or incised motifs, as well as indented and stamp-rolled impressions. Often, the motifs are filled with a white paint, which accentuates the impressions (see fig. 48).

The other main cultural assemblage is known as the Cetina group (e.g. Marović and Čović 1983: 191-232) The Cetina wares are usually found to be incised, grooved, impressed, and rippled. The typology originates from wares found associated with tumuli and cave stratigraphies near the river Cetina. Della Casa points out that there are still many uncertainties involved with the internal sub-divisions within the Cetina group, as well as the overall absolute chronology (1995: 568). One aspect that does reign consistent in these differing views (Marović and Čović 1983; *versus* Govedarica 1989: 112 in Della Casa 1995) is the influence of the Adriatic type wares on the early or "proto-Cetina" materials. The classical, or middle Cetina phase, is situated earlier in the EBA (e.g. the Reinecke Early Bronze A1-A2), while later Cetina is placed at the end of the EBA (the starting of Reinecke B1).

The Dinaric group[35], which was present in the excavations at Velika Gruda (see Della Casa 1995; 1996; Primas 1992: 47-55; 1996), usually consists of pottery with indents, carvings, or cord impressions. This group of pottery was not included in the discussion of the Copper Age materials excavated at Bukovič-Lastine (Chapman et al. 1990), probably because the early Dinaric phase is at the beginning of the EBA, and hence unassociated to the Eneolithic at Bukovič. Della Casa points out that the EBA to Middle Bronze Age (MBA) spectrum of the Dinaric group is more or less coeval with the Cetina (1995: 568-569)

[35] The Dinaric group is also recognized as the Posušje group, as per Čović 1989 (see Della Casa 1995: 568-569).

Della Casa (1995: 572) has offered a new chronology from the Late Copper Age (LCA) to the EBA for Dalmatia, based on recalibrated radiocarbon dates from more recent bidecadal high precision curves (e.g. Kromer et al. 1993, in Della Casa 1995). Even though questions still exist regarding the reliability of certain samples and the dates derived from them, the Della Casa assessment offers the only ^{14}C based chronology for the LCA-EBA procession on Dalmatia.

Three isotopic dates were obtained from the excavations at Eneolithic Bukovič-Lastine on the Central Dalmatian Coast (Chapman et al. 1990: 32; and see fig. 30). These have been assessed by Della Casa (1995: 572), and show that the Nakovanj group at Bukovič dates into the LCA, ca. 3450-2950 BC in the 1σ (68.2% confidence) range, and is now recognized by Della Casa as LCA 1. The Adriatic group has not been isolated in cave stratigraphy and tested as such, but Adriatic type wares found in Level VI at Odmut cave and associated with radiocarbon dates (Marković 1985 in Della Casa 1995), are recalibrated to ca. 3036-2745 BC at 1σ. This conforms to dates obtained from the central grave at Velika Gruda, associated with Adriatic-type wares (Primas 1996), which would fall into Della Casa's LCA 2 group. These roughly parallel the well sampled dates from the Vučedol site in eastern Croatia (e.g.. Srdoć et al 1987). Forenbaher (1993: 247) has grouped Vučedol into the EBA, but does account for the LCA 2 dates which Della Casa cites for comparison (1995: 572) and so essentially, a chronological integrity is maintained.

The Cetina dates which can be applied to Dalmatia are obtained from associated wares at sites away from the eastern Adriatic coast (e.g. the Vinkovici-Hotel site near Vučedol; Srdoć et al. 1989; and see figure 22, this text) which fall into the 2460-2140 BC 1σ range (Della Casa 1995: 572; Forenbaher 1993: 248). This sub-division of the Eneolithic is recognized by Della Casa as the LCA 3. This raises a problematic point: The Cetina has always been considered EBA in Dalmatia, and as Della Casa's new sub-division of the LCA-EBA shows, the Cetina would now be considered LCA 3 (based on radiocarbon dates), and at best only infringes slightly on the ^{14}C parameters of the EBA (1995: 572-575). Further studies must be conducted to support this restructuring of the chronology throughout Central and Southern Dalmatia.

Further complications are apparent at the Bukovič site, which revealed both Nakovanj and Cetina wares in a similar context (e.g. Chapman et al. 1990: 39).. This of course could be generally permitted as a brief cultural overlap (as seen in the 1σ range of the ^{14}C dates) in Della Casa's LCA 1 to LCA 3, but prior to these Bukovič finds, the Nakovanj and Cetina were not stratigraphically contemporaneous. It is clear that the eastern Adriatic seaboard still has its problems regarding the Eneolithic to Bronze Age

chronologies, and as the recent dates of the few pertinent references suggest, they are only just beginning to be tackled.

Settlement sites as such are almost unknown during the LCA-EBA. Limestone tumuli attributed to the EBA (based on grave goods) are documented on the islands, including the numerous Bronze Age tumuli from the island of Hvar (Petrić 1979: 67-78). In the Vela gomila tumulus near the village of Gdinj, a bronze ring and sword were found, although as Marović points out, villagers cannot remember if they were from one grave or two separate ones (1985: 5-35). At the Vira cemetery site on the western end of Hvar[36] , Marović associates a few finds to the EBA based on a typology of cup handles found among the graves and their associations with regional EBA assemblages (ibid.).

Numerous pottery finds of the Adriatic type, including a bronze pendant, were reasonably well stratified in Grapčeva spilja on Hvar (Novak 1955) while there is ample evidence from Korčula's Vela spilja of well stratified Nakovanj and Adriatic type wares (Čečuk 1986; 1989; Dinko Radić pers. com.). Likewise, a shaft hole copper axe was discovered in the cave as well as an infant urn-type burial (Čečuk and Radić 1995: 44-45).

It has been noted that there is little evidence on the Dalmatian islands for settlement evidence during the Middle Bronze Age (MBA) (Čače et al 1995: 6), although there are indications on the mainland that defended hilltops might have fully developed by this time (Benac 1986: 22-34). Pottery finds from the Maslinovik prehistoric hilltop structure on Korčula have similarities to some of the excavated and ^{14}C dated materials from Velika Gruda, but these would probably correspond to the Late Bronze Age (LBA). Likewise, due to the general poor diagnostic nature of the EBA to Late Iron Age (LIA) ceramics found on the Dalmatian islands (more often than not extremely course and containing high quantities of calcite inclusions), most of the surface finds can only be placed within a "floating" LCA-LIA framework.

By the LBA, there appears to be a reliance on tumuli as the means of burial for throughout Central and South Dalmatia. This can be seen as a contrast to the northern areas (some coastal, most inland), where burial in urns seemed to be the contemporaneous trend (Vinski-Gasparini 1971: 312-323; 1973; 1983). The settlement patterns on the mainland indicate a transition to defended hilltops, although this is purely assessed due to the lack of lowland evidence. Massive inundation of the lowlands with soils during post-Bronze Age periods, specifically Roman and Venetian, has made it difficult to detect the lowland settlement patterns.

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[36] For a recent overview, see Gaffney et al. (1995: 41-64) regarding the limestone tumuli cemetery at Vira, on Hvar.

On the islands, many of these hilltop structures have a rather undefended nature, with many of the *in situ* ramparts appearing more as terraces. Hence, both the concept of "settlement" and "defended" are still not necessarily clear. Recently, computer enhanced evidence (through a GIS), suggests a clear link between fertile lands and the geographical positioning of these hilltop structures, with possible implications towards ritual landscape monuments (Gaffney and Stančič 1991). By the LBA, Batović has placed two regional cultural groups in the region. These are recognized as the Liburnian and Dalmatian groups. The divisions are based purely on metal-ware typologies, and although they are placed in the LBA, actually seem to be more comparable to later Iron Age materials and assemblages (Batović 1983: 339-390).

6.9 The Iron Age of the Dalmatian Coast

Gaffney recently characterized the Bronze and Iron Age situation on the Dalmatian Coast and islands in quite realistic terms (1992: 129). Almost two millennia of cultural occupation throughout Dalmatian barely produces enough diagnostic evidence to present a general overview of these periods. This can be linked to an almost complete lack of hard evidence that can be attributed to specific phases or dates within these periods. The archaeological traces, as stated in the last section, are either limited to very poorly documented hilltop sites, many with only a few fragments of the aforementioned undiagnostic course wares, or poorly preserved cist burials found in limestone tumuli (e.g. Gaffney et al. 1995: 44-51).

The most recent archaeological review of the Iron Age of the Dalmatian Coast reveals that it is essentially a continual procession from the LBA (Čović 1987: 442-480; Batović 1987: 339-390). It is difficult to temporally pinpoint any significant transition point (e.g. a change in artifact typologies, structural changes, alternate burial practices, etc.), so the present understanding of the actual beginnings of an Iron Age of Dalmatia is loosely based. Once again, assemblage materials indicate two localized groups on the East Adriatic; the Liburnian group and the Dalmatian group. The Central and Southern Dalmatian islands were more than likely associated with the Dalmatian group, while the Liburnian group was stretched out across the length of the Adriatic Basin, possibly excluding these islands. To the south, the Liburni might have had contacts and even control in some manner over Corfu (Strabo V; 1-2). Likewise, Pliny the Elder mentions that the Liburnians might have actually settled on the Italian side of the Adriatic (III; 110-112), but naturally, these observations were made centuries after the alleged events. However, in support of this historical reference, Petrić (1993: 217-229) notes that Apulian manufactured geometric pottery is known throughout Central Dalmatia. Probable Efke wares, of northern Italian origin, have been found in the Spilja u

Istruškom dolcu on Korčula. Although stylistically, these could be attributed to certain Liburnian assemblages (Batović 1987)..

As described below, the hillforts and other Iron Age prehistoric hilltop structures are still in use during this time, and continue well into early Greek and Roman contact periods. It can be stated that the prehistoric Iron Age of Dalmatia overlaps with what can be called the "protohistoric" period. The extent of Grecko-Roman associations with the local populations is not well documented, as will be discussed in the next section. Therefore, it is unclear as to whether the sites mentioned below became Greek hillforts, or were hillforts with local populations who traded with, or worked for, the Greeks.

Greek finds from the Kopila (appendix b, KB-017) prehistoric hilltop structure on Korčula also show signs of these early 6th century B.C. Greek contacts. Numerous fineware sherds recovered from a test unit, examined by Dr. John Hayes, confirm 6 th century B.C. materials present on the hilltop. A Corinthian vase (Lisičar 1973: T.4, fig. 10), dating to ca. 580 B.C. and allegedly recovered near the town of Blato (on Korčula), supports the notion of a 6th century Greek presence in the area. Furthermore, a Corinthian sherd (also confirmed by Dr. John Hayes), recently found during house constructions below Gradina (KV-006), on the western side of Korčula, further verifies 6th century B.C. contacts (see appendices b, KV-007).

6.10 The Greek and Roman Associations with the Adriatic Islands

The Greek colonization of the Adriatic during the Late Archaic Period is not well documented, although there are numerous historical references to the possible presence of Greek colonies on the Eastern Adriatic seaboard during this time. A Late Archaic Greek colony was supposedly founded on Korčula sometime in the first half of the 6th century B.C.. The colony was apparently established by the Cnidians (Pseudo-Scymnus 421, Strabo 7.5.5, Pliny: III, 152), supported by the Corcyrians (Herodotus iii, 48-49; see Section 10.1.1, this thesis) and launched from the Greek island Kerkira (modern Corfu). As the colony was established on Korčula, the name given to the island, in honor to Kerkira but not to be confused with the latter, was Kerkira Melaina[37] .

There are at least three possible locations for the colony as outlined by Beaumont: the modern town of Korčula, the Lumbarda area, and the Vela Luka area (1936: 174-175). It should be noted that the location of the Cnidian colony still eludes researchers, but specific scenarios will be discussed later in this thesis. A review of the situation in light of recent survey of the island has been recently offered (Bass and Radić in press: a). Other discussion can also be found elsewhere (e.g. Beaumont 1936: 173-174,

[37] Korčula's name in antiquity was Kerkira Melaina (a.k.a. Corcyra Nigra, Crna Korkira or Black Corcyra.) This reference (i.e. black, *crna, melaina,* or *nigra*) stems from Korčula's dark pine forest (Appolonius Rhodius N. 569) and its similarities to the pines and forests on island of Kerkira.

Lisičar 1951: 51-125, Wilkes 1969: 8-9, Rendić-Miočević 1980: 229-250, Boardman 1980: 227, Kirigin 1990: 293, and Wilkes 1992: 113).

Contemporaneous Greek finds from the 6th century B.C. are known from the tiny island of Palagruža (Forenbaher et al. 1994; Kaiser and Kirigin 1994: 65-71; Kirigin 1995). Graffiti on numerous fineware pottery fragments even suggests that the site might have been connected with the cult of Diomedes, previously thought to have been associated with the Tremiti (Kaiser and Kirigin 1994). Likewise, the recent finds from Korčula, briefly discussed in the last section, all indicate some type of Greek presence around the 6th century B.C.

However, the first Greek colony that is clearly evident on the Dalmatian islands is found on the island of Hvar at the site of ancient Pharos, now known as the town of Stari Grad. The Greek colony and some of the activities of its settlers is vividly detailed by Diodorus Siculus (XV; 13-14) and dates to ca. 385/ 4 B.C. Greek colonial evidence is also known from the island of Vis, known as Issa in ancient times. A Syracusean colony settled there sometime in the 4th century B.C., although Kirigin has pointed out that there is a lack of solid ceramic evidence which would indicate colonial on the island before the mid or late 4th century (1990: 291-321). The remains of a colonial settlement are easily noticed on the island, but the precise foundation dates are still undetermined.

The Pharian colony eventually ran into a few troubles with the local inhabitants (Diod. XV., 13.4-15, 14.2). After a vivid sea battle with a disgruntled native Illyrian population, the colony lost its niche and came under the political control of the Ardiaeian kingdom of South Illyria by the mid 3rd century B.C. (Wilkes 1969: 13-28). Various political maneuvers on the part of the Illyrians provoked the Romans into launching an attack across the Adriatic in 229 B. C. (the First Illyrian War). Following that adventure, a local named Demetrius retained immediate control over the island of Hvar (ibid.) and this prompted the Second Illyrian War, executed by the Romans in 219 B.C.

During the actions of the 1st campaign, the colony on Issa somehow maintained a state of independence, or more precisely, did not fall to the Romans. This allowed a sense of freedom, and sometime in the 3rd century B.C., Issa sent a colony to Korčula and probably settled in the area near the Lumbarda polje, although the location of this colony is also unknown. The extremely well preserved *Psephisma* (inscription) was found near an ancient cistern on a hilltop known as Koludrt (e.g. Kirigin 1990: 312; and see fig. 3, this text). The inscription gives precise details concerning 4.5 *plethra* of land which are to be given to over 200 colonists, as well as land within the town walls (see Rendić-Miočević 1965: 77-81, Rendić-Miočević 1966: 133-141, Lombardo 1993: 161-188, Cahill 1993: 345-346; Fraser 1993: 167-174). Two contemporaneous graves were detected ca. 100 m. south of the Koludrt hill (see Kirigin 1990: 311-312), and fragments

of Hellenistic pottery have been found in the area during this research. Possible Greek land divisions have been discussed by Zaninović (1980/81: 93) and were investigated recently by the KARG (Bass and Radić in press: a), with the aid of aerial photos (see plate 1). It is clear from the photo that some sort of regularity exists in the land divisions, but this by no means compares to the Greek land divisions of the Stari Grad plain on Hvar (Pharos), which have also been detected with satellite images (Gaffney et al. 1994: 48-52).

As outlined above, by the 3rd century B.C., it is possible to suggest that the Adriatic would have been cluttered with Greek, Roman, and Illyrian, vessels, traders, and settlers. The First Illyrian War can be traced to intervention by the Romans into the local politics of the Central Dalmatian islands, specifically with the troubles with the colony at Pharos. As mentioned, by ca. 229 B.C., the Romans had sailed across the Adriatic to contain Illyrian expansionism, with the local politics of *Illyricum* again provoked the Romans into war in 219 B.C (Second Illyrian War).

Although it is probable that the general area was a *de facto* Roman possession, possibly by the early 2nd century B.C, and definitely by the late 1st century B.C, the extent of low-level Roman connections across the Adriatic during and after this period is unclear,. By 59 B.C., Caesar had taken over all political and economic aspects of *Illyricum*, including the islands (entitled under the *Lex Vatina*), but the exact nature of Roman colonization on many of the East Adriatic islands is not well researched. Korčula definitely had Roman settlements, as the numerous diagnostic villae rusticae indicate (see fig. 90). However, the exact extent of Roman development on the island and connections with the local population are not well known.

The later periods of protohistoric Central and Southern Dalmatia are quite hazy. Numerous wars, mostly civil, must have had some impact on the islands, but the exact status, either politically or economically, is not well understood. By the mid- 7th century, it is known that Salona was taken by the Slavs, and by the 8th century, a local Slavic group known as the Pagani had control of the Central islands, including Korčula. The status of the native populations during this period is poorly understood. Finally, as briefly mentioned in Chapter 5, the area eventually fell under Venetian control, with Korčula town occupying a special place in the region.

Chapter Seven

The Research Design and Methodology for this Thesis

7.0 The Research Design for this Thesis

The fact has been recently pointed out that while Korčula is one of the larger islands on the Dalmatian coast with an area covering roughly 280 km^2, there has been no systematic survey of any kind on the island (Bass and Radić in press: a). It has been necessary to establish a reliable system for data collection, documentation, artifact storage, and data analysis, not only for use in this thesis, but also for future archaeological studies on Korčula and in the region.

As discussed in the previous chapter, there have been a few fairly recent archaeological surveys along the Dalmatian coast (e.g. Batović and Chapman 1985; Bintliff and Gaffney 1988: 151-175; Forenbaher et al. 1994: 13-52; and Gaffney et al 1997), so it would seem logical to adhere, at least vaguely, to a similar system of data recording. This would facilitate regional database comparisons, not only among the archaeologists currently working in the region, but also for "outside" investigators interested in Dalmatian island archaeological and cultural studies. Of course, research designs, funding, and other factors always carry weight as to how sites can be tested or examined, but these factors should not reflect on the field survey form as it is merely a recording device. It should be noted that, although the research for this thesis concerns primarily the prehistoric and protohistoric occupations on Korčula, sites from all periods were recorded when encountered.

7.1 Defining an Archaeological Site

Before a description of the site record forms employed for this research can be detailed, it will be necessary to actually define an archaeological "site" as interpreted in this research. For an archaeological researcher, without a site, sites, or definition of sites, mapping and spatial analysis are naturally impossible (Wagstaff 1991: 9,10). There are many approaches to the factors that comprise an archaeological site. The final definition of "site" employed, as a discrete archaeological sampling unit, will naturally affect the investigation, subsequent analysis, and conclusions.

There are numerous instances of archaeological researchers using variations on the theme of "site" description (Schofield 1991: 3-8). Generally, the focus centers on the amount of artifacts or other cultural remains that qualify as a "site". The problems concerning secondary depositions of artifacts away from the location of primary

occupation or activity (see Butzer 1982: 43-156) might also affect the labeling of the "site". Therefore, pertinent questions must be addressed regarding "site": Is a single artifact, such as a lithic tool found on a slope, considered a "site"? Should two or more potsherds in isolation be considered a "site"? Is a scatter of pottery across a field actually a cultural "site"? Is a scatter at the base of a hill the "site" even if there is evidence, such as structural remains, that indicate the original "site" was on the hilltop above? As noted elsewhere in Mediterranean survey, the site might or might not be the actual location of past activities and it is this matter that is pressed into separate investigation (Cherry 1984: 117-120).

True guidelines, as such, for a "site description" can be found in the heavily legislated federal and local Cultural Resource Management programs implemented in North America (see Gummerman and Schiffer 1977) [38]. A simple definition would be to consider a site as any spatially discrete artifact surface scatter (e.g. Ammerman 1985: 33-40). To carry the idea of "site" further, it can be defined as a discrete and potentially interpretable locus of cultural material, spatially bounded, with the boundaries marked by at least relative changes in artifact density (Plog et al. 1978: 389). The Neothermal Dalmatia Project, conducted in the lowlands near the coastal town of Zadar, Croatia, established a general site classification system used for the survey. Archaeological remains were recorded as "single finds" (1-3 artifacts in a collection unit), "findspot" (location with 4 or more artifacts in a collection unit), and "monuments" (archaeological sites with upstanding remains, such as cairns, hillforts, etc.) (Chapman and Shiel 1988: 2). It is clear that if the exact parameters of the "site" are not established, other researchers reviewing the data, conducting follow-up surveys, or using the data-set for alternate analysis, might misinterpret the information.

Therefore, a set of general site recording guidelines has been established for the research on Korčula, which is now incorporated into an archaeological "Sites and Monuments Registry" in the *Centar za Kulturu,* Vela Luka. As a working definition for this research, a site is viewed as:

"The present location of past cultural evidence, including all associated archaeologic, anthropologic, geologic, or affiliated evidence."

The general guidelines used are as follows:

1. An "isolate" or "single find site" consists of 1-3 artifacts, which are obviously or spatially discrete (without subjective interpretations).

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[38] The State of California (USA) has established guidelines for completing an archaeological site record for the California Archaeological Inventory. Likewise, the guidelines are in use at the Federal level, including the U.S. Forest Service and the Bureau of Land Management (BLM). The manual (DPR 422 A-1: Rev. 5/ 86) is updated and printed at the Office of Historic Preservation, Sacramento, California.

2. A "site" will consist of four or more artifacts that are obviously or spatially discrete (without subjective interpretations).
3. "Monumental" cultural remains are those sites with visible structural features, upstanding or destroyed, which are obviously or spatially discrete. However, these are viewed as another type of "site" and adhere to the similar defining parameters.

Practical examples of the applications of these definitions for use in the survey on Korčula are as follows:

- Two tumuli situated 1 meter apart are to be recorded as two separate sites unless further investigation and/or interpretation suggests otherwise. The situation might well be that they are not at all contemporaneous, but merely situated in the same locality. It is premature to suggest on a site record form that the features are contemporaneous, (with the post-survey implication that they must be from the same period).
- A multi-occupational site, such as a cave, a tumulus, or a prehistoric hilltop structure, is recorded as one site, even when the stratigraphy or scatter suggests temporally distinct occupational remains. The evidence is situated at one specific geographical position, therefore, it is one multi-occupational site.

7.3 Software, Hardware, and Site Codes

Many different methods were examined for appropriate site codes and site attribute designations to be used in conjunction with a computer database. The systems developed for systematic survey and research on the nearby islands of Vis, Palagruža, Hvar (Bintliff and Gaffney 1988: 151-175; Grossman 1989, Forenbaher et al 1994: 13-52, Gaffney et al. 1997), and Brač (Čače et al. 1995) appealed. Many of these surveys were later coupled with computer-based Geographical Information Systems (GIS) packages (see Gaffney and Stančić. 1991: 59-77), so these examples seemed quite applicable to work on Korčula. Some of the specific pitfalls of these databases were investigated (Vince Gaffney: pers. com.) and a standardized system was devised.

7.3.1 Computer Software and Hardware

Essentially, the Korčula database is similar to the aforementioned systems, but specifically designed to fit the nature of the current and future research goals on the island. The original survey data was entered into the "Paradox" database package. However, the data was later transferred into the "Microsoft Access" (v. 2.0) database program because of the latter system's general user-friendliness, ability to accept Croatian font characters, capability to enter large blocks of text in a field without storage elsewhere in the program, and compatibility for intended future work with the "IDRISI" GIS package . Other software used for the thesis were the "Microsoft Excel" (v. 5.0) and the radiocarbon calibration package "OxCal", v. 2.18 (based on the Stuiver et al. 1993 calibration).

Computer hardware was taken into the field, but a few problems arose. The system used for the research was a Dell 325/ NC portable with 120 Mb. hard drive and 12 Mb. RAM. The 1993 season was plagued by lack of daytime electricity due to the regional conflicts of the former Yugoslavia. This directly affected the ability to work on the computer, as the internal battery would only last for ca. 1 hour with constant hard drive use. Power fluctuations in the evenings were not a problem, as the onboard battery would turn on when needed and recharge when the power went back up to the appropriate level. However, the computer could not be taken directly out into the field environment due to the rugged nature of the survey terrain. This fact, along with the inability to recharge the batteries during the daytime, made field use of the computer impractical.

7.3.2 Site Code Designations

The site designations used during this research correspond to the general (and legal) township area on Korčula where the site is located, and are coupled to a numeric value (see figs. 19-20). Essentially, the designations employed are a simple alphanumeric type system. The designations in themselves do not carry any special map or coordinate values, such as those used in other regional survey (e.g. island of Hvar, or AIP research), but rather serve simply as discrete individual entries in the database. The coordinates or corresponding map sheet numbers are found elsewhere, on the database entry fields. Furthermore, the geographic area in which the site is located makes a convenient label when specific locations on the island require analysis, general review, data entry, or follow-up survey.

For example, all of the sites in the Vela Luka township area (KV) can be looked up without the need for an actual database query, as they are filed in sequence in the database (e.g. KV-001, KV-002, KV-003, etc.). If a site is located in the officially recognized Vela Luka township area, then any questions or other information regarding the site, the property, or the owners, can be rapidly directed to the town mayor's office (*opčina*) or more often, to various people in that township (see fig. 20). Likewise, with paper files (all site record forms are stored on the island), it is much easier to retrieve by geographic township than any other recording method. This system can be altered to conform to other regional databases, if the need arises, but during this research, it seemed to be the "user-friendliest" approach examined.

7.4 Site Attributes and Typologies Pertinent to this Research

The various site attributes assigned to sites are shown in figure 22. The system has been well tested throughout this research regarding the data entry, the data

processing, and the data output. In the future, the system used in the computer database will be expanded to be completely bilingual.

Sites are not labeled with "monumental", but rather as general typological or categorical sites such as "tumulus/ cairn/ gomila", "simple prehistoric hilltop structure", "villa rustica", "Palaeo-Christian church", etc. The attributes assigned to each site are transferred from the field data collection forms to the database and serve as the foundation for the analysis of raw survey data. Certain attributes require accompanying text in the database to clarify the situation, such as "AAA00-Undetermined". Most of the typologies used in the site attribute field are self-explanatory, but a few of the more important aspects particular to this research will be detailed below (Sections 7.4.1-7.4.6), to clarify the parameters in which they have been used.

For example, the use of the term "hillfort" tends to be misleading in Dalmatian archaeology. Therefore, this term (as a generic archaeological description) will be avoided unless there are detailed explanations that justify the use. It has been noted elsewhere that the archaeologist should avoid the trap many others fall into when equating a type of site with a potential, but not yet explored or determined, function of that site (Joukowsky 1986:38). This definitely applies to the Dalmatian islands, where hilltops with an undefended nature "often represented by little more than a small rampart sealing off a mountainous spur" (Gaffney et al. 1995: 45) and many with an "apparent non-functional nature" (Čače et al. 1995: 30) are reasonably documented. Hillforts or defended hilltop settlements are also known in the region, but lumping all prehistoric hilltop structures or remains into one category "hillfort" seems archaeologically misleading.

7.4.1 Prehistoric Hilltop Structures

The semantic issues regarding site typologies do not need to be reviewed for this thesis. However, the archaeological situation on the terrain of the Dalmatian islands seems to warrant research-specific descriptive terms. Therefore, the use of the term "prehistoric hilltop structure" has been applied to this research. Any prehistoric remains found on a geographic hilltop fall into this category. The two types found in this category are the "complex prehistoric hilltop structure" and the "simple prehistoric hilltop structure" (see the distribution map, fig. 71). . The application of these terms was detailed recently (Radić and Bass in press: a), and is credited to Predrag Novaković, Department of Archaeology, Ljubljana. Originally, all hilltop sites were incorporated into a much more specific typological classification. After the data from the survey began to filter, this system appeared rather trivial. Most of the construction features that appeared unique, therefore requiring different typological descriptions, seem to be

mere variations of structural adaptations to the natural geological and geographical features of the hilltop. The author discussed these problems with Novaković, and the system suggested was employed for this research.

Any special features incorporated into the structure, such as possible towers, should be examined through individual site investigations and not lump categorizations. Specific features such as these, associated with prehistoric hilltop structures, are included in the database, but under other site attribute codes.

7.4.2 The Complex Prehistoric Hilltop Structures

All sites with this attribute have some evidence of a rampart or "terrace rampart" system of dry-stone construction with limestone materials. A terrace rampart can be described as a dry-stone rampart, but with only one face (e.g. the up-slope side of the rampart is built directly into the hillside, the down-slope has a stone face, similar to the terraces used for agriculture). Most of these structures on Korčula have a rather "undefended nature", with *in situ* ramparts rarely more than 1 m. in height, and most measuring between 30-80 cm. Complex structures can be identified with dry-stone wall enclosures, essentially encompassing the site as in the Gradina 555 (see fig. 82, KC-002). These features can be extended or semi-circular (Forenbaher et al. 1994: 29-30, 32), often used in conjunction with natural limestone outcrops to form the structure, as in Velo Gračišće-Dubrovica (fig. 81, KS-010). The complex structure can also have a combination of the two aspects mentioned above, as found on Sutulija (fig. 83, and plate 5, KS-006). A minor, yet distinguishing, point is the fact that the complex structures tend to be much larger than the simple structures, often with limestone "gomila" associated into or near the rampart or terrace rampart (see Vujnović 1990: 47-64 for a recent reference to similar features found on the island of Hvar).

7.4.3 The Simple Prehistoric Hilltop Structures

The simple prehistoric hilltop structures can appear as non-ramparted dry-stone enclosures, also recognized as possible kula (towers), as seen on Lokvica (fig. 72, KZ-006) or Sutvara (fig. 73, KS-007). The type also appear as large hilltop limestone cairns of varying sizes with no evidence of ramparts, such as the hilltop site with the toponym Gomila (fig. 74, KZ-003). Many have evidence of basal structural features consisting of up-standing limestone slabs, but only one of the type has (see appendices b, KB-015) has documented burial evidence.

7.4.4 The Limestone Cairns, Tumuli, and Gomile

Throughout Dalmatia, limestone cairns come in "an impressive array of sizes, shapes, and geographic locations...(however), no facile assumptions about dating can usually be made" regarding these structures (Chapman and Shiel 1988: 11). The Croatian term gomila (or gomile in the plural) commonly refers to the limestone structures. Basically, any pile of stones in any geographical setting receives the tag *gomila,* and in review of the older archaeological literature, one might be lead to equate these to tumuli (i.e. cairn burials)[39].

On the northern Dalmatian coast, these cairns have been labeled primarily as signs of land clearance and only in certain circumstances as burial monuments (Chapman et al. 1987: 128-129). To make matters even more confusing, on the island of Hvar, it has been has observed that cairns with burials frequently occur within fertile agricultural zones while many cairns with no burial evidence at all occur in areas completely unrelated to agricultural activities (Gaffney et al. 1995: 48). Hence, if so many of these cairns are related to past and current agricultural activities, why are these empty limestone gomile found in areas where no agriculture has occurred?

Clearly, these structures are an important part of the study of past landscape uses and development, and many past environmental factors may go completely undetected when archaeological assessments are made. No matter how one examines this complex issue plaguing archaeological research on the Dalmatian karst, there is still no clear way to date, label, or classify, these structures without intrusive examination.

7.4.5 The Underwater Sites

The known underwater sites, either shipwrecks or artifact scatters, are not well documented in the water's off Korčula. Specifically, none are officially published. The 1988 marine archaeological survey (I. Radić 1988: 213-227) conducted by the *Zavod za zaštitu spomenika kulture* (former Yugoslavian branch) stopped off in the waters near Korčula, but unfortunately, the exact details of this leg of their research journey were never published. However, Irena Radić did provide the author with the basic documentation and survey details.

Otherwise, most marine sites, unless detected on snorkel survey by the author, are completely unconfirmed. However, the numerous amphorae found in the homes of many villagers on Korčula suggest that there must be dozens of submerged sites off the coastline of Korčula. The author's consultations with a former "amphorae diver" from

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[39] e.g. ".skeletons of the then living inhabitants and other things which are likely to throw light onto the (past) life in Dalmatia...are covered by thousands of mounds scattered all over ...the littoral, the interior, and the islands" (Novak 1955:305-306)

the town of Korčula revealed that there are numerous sites off the eastern end of the island, either in the Pelješac Channel, or near many of the small islets. Given the strategic importance of this channel for both past and present maritime travel, these finds do not come as a surprise.

7.4.6 The Terra Rossa Soils Near Sites

There is a need to define the parameters of this site attribute, since most localities on the island have some sort of red soils, or terra rossas, in the immediate vicinity. This parameter is applied to sites that have active agriculture or significant soils within ca. 100-150 meters of the site. This attribute is quite problematic, since it is impossible to know exactly which areas of the island were under agriculture in prehistoric times and which were recently modified to serve that purpose. This parameter is naturally incorporated into "site catchments", although realistically, all sites would need case-specific analysis. It should be noted that this attribute applies to all areas that meet the criteria, incorporating both the large polje and small fields.

These areas should not be confined to past agricultural connections, since they could have also served as grazing areas. Furthermore, the presence of these soils near sites can also indicate the potential for detecting preserved "off-site" archaeological evidence. Therefore, these soils can eventually provide a multitude of data.

7.5 The Field Data Collection Form

The Korčula field form serves a duel-purpose role as the basic field record form for this research and Sites and Monuments Registry, kept at the *Arheološki muzej,* Vela Luka (see figs. 17-18). The field forms were similar, in many respects, to other field survey forms used on the Dalmatian Coast, such as those from the Neothermal Dalmatia Project and the Ager Pharensis/ Hvar Survey Projects. Those forms were reviewed and a suitable field form was then devised for specific application to Korčula. As mentioned before, it could be possible to link the databases from these other projects to Korčula, so a similar system of field data recording might prove to be worthwhile.

The field forms are held in the *Centar za Kulturu, Arheoloski muzej,* in Vela Luka, and are bilingual (Croatian and English). This was done, in part to facilitate easier access for local and regional investigators, and to minimize misinterpretations of the data required on the forms during the field collection. Essentially, the form leads the field archaeologist through a series of observations that need to be conducted at each site. The points to be noted consist of archaeological, geological, environmental, spatial and other aspects that are pertinent to the proper evaluation and analysis of the site.

Space is also provided for extended text. Once the forms were back in the museum, the information from the form was transferred to the actual computer database.

7.6 Materials Processing and Artifact Storage

A system has been devised to label and conserve the artifacts that were collected in the field (fig. 21). Extensive conservation or preservation of artifacts brought in from the survey or associated fieldwork was not required. In the future, it is hoped that the *Arheološki muzej* in Vela Luka can obtain the proper materials needed, as eventually, these techniques might need to be applied.

Once the artifacts were brought in from the field, they were processed by the appropriate means and stored in a ziplock-type freezer bag. Each freezer bag that has been used for storage has the site number along with collection and provenance information written on the outside of the bag in indelible marker. That information is then recorded in the same format on a plain white insert card and stored in the freezer bag with the archaeological sample (as in fig. 21). This redundant recording allows the artifacts to be easily taken out, examined or displayed, and returned to the storage depot with minimal chance of loss or confusion as to which artifacts were from which bag. The nomenclature found on the sample, artifact bags, and insert card, was also recorded on the field forms for the accompanying site. The artifacts have been stored at the end of each season in the *Arheološki muzej,* Vela Luka.

7.7 Survey and Research Equipment

As is often the case in archaeology, the usual constraints of funding, time, and manpower often mean that the questions the survey sets out to answer must be very specific. This very scenario is well detailed in the methodology for surface survey on the Greek Ionic islands of Kephallenia and Lefkas (Gallant 1986: 405), due southeast of Korčula. Likewise, constraints were also reflected in the research for this thesis.

7.7.1 Maps and Aerial Photos Used for the Research

The survey was conducted with the aid of 1: 5000 and 1: 25,000 land survey maps, 1: 50, 000 military maps from the Second World War, and 1: 100, 000 hydrographic charts[40] . Aerial reconnaissance photos [41] were also obtained for review.

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[40] The 1: 5000 and 1: 25, 000 scale maps are up-dated sheets (1984) from the Republička geodetska uprava SR Hrvatska, based on the Gaus-Krieger projection; 1: 50, 000 scale maps are U.S. Departments of War and Navy AMS-1 series (now Dept. of Defense), based on the Lambert Conical Orthomorphic projection/ Bessel ellipsoid, Greek Datum; and the 1: 100, 000 scale maps are from the Državni Hidrografski Institut-Split, Croatia, based on the Mercator projection/ Bessel ellipsoid.

Unfortunately, the original negatives were not accessible, so the photos obtained for this research are actually photos of the contact prints from the original 12-inch negatives. The contact prints of archaeological interest were set aside and photographed using a Nikon FM2 with 50 mm-1.8 lens with distance rings attached for macro work (see figs. 37-39, for site and target information, held by the author).

7.7.2 Experimental Use of the Global Positioning System

A Trimble Global Positioning System (GPS) satellite navigation unit[42] was tested and incorporated into the survey during the first seasons (1994-1995) although the initial results were not so accurate (for site recording). The land survey maps, either the 1: 5000, 1: 25,000, or the 1: 50,000 scale, all revealed eastings in Universal Transverse Mercator (UTM) that did not seem to directly correlate to the coordinates displayed on the GPS unit. So while the northing UTM was accurate up to 10-15 meters, the easting displayed on the GPS unit was at least ca. 250-400 meters off, if not more. Several solutions, including the establishment of a local datum, were explored by local geosurvey specialists but in the end, the accuracy was not acceptable. The number of satellites acquired by the unit, anywhere from 3 to 7 depending on the location of the unit, were sufficient to obtain accurate readings, but the problems persisted. Dr. Zoran Stančič (Slovenian Academy of Sciences, Ljubljana) found the same scenario present with a similar GPS unit during survey on the Croatian island of Brač (1994). His solution was to take the coordinates from the GPS unit in longitude-latitude readings and convert them back over at a later date to the corresponding UTM coordinates (pers. com.). However, this process can be rather tedious when many readings need to be converted.

Finally, during the 1996 field season on Korčula, the possible reasons for the strange easting coordinates was discovered. Current United Nations (UN) maps of the region clearly display UTM data in the accompanying map legends. Standard GPS units all give the UTM coordinates based on the grid system known as the WGS-84. All of the maps used on the Korčula survey had UTM based on an earlier WGS system. Overlaid onto a map, the older and current WGS-84 grids look to be very similar. In reality, the grids do not correspond well below the 200-meter accuracy level. Unfortunately, the UN maps were not available for the research. In retrospect, it might have been UN and NATO activity in the region that affected the civilian carrier readings, known as

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[41] .The aerial reconnaissance photos were taken just prior to 1991 by the former Yugoslav Air Force. The camera used was a Wild RC-10, and the altitudes were 4 km.(1: 800) and 7.5 km. (1: 15, 000). Negatives were of the 12-inch type. The prints from these negatives were accessed at the Korčula and Blato *opčine* (town offices), with permission.

[42] Trimble Navigation; U.S.A.; Scout-Model "M".

"Selective Availability". In any case, the GPS can be of great assistance on survey, not only in locating and mapping sites, but also for recording and downloading daily survey data directly onto a computer database, or for establishing ground truths. In the future, possibly the GPS can be of more use for research on Korčula.

7.7.3 Basic Archaeological Field Equipment

Since Korčula is essentially a long and thin island, navigation and general field orientation were not constant problems. However, due to vegetation, mountainous terrain, and minor ambiguities in the land survey maps (and the fact that GPS showed unreliable results), many archaeological sites required triangulation from major geographic features to pinpoint their actual locations. A Suunto KB-014 azimuth sighting compass, along with a Brunton Pocket Transit[43] were used for the triangulation requirements, as well as mapping, and establishing proper grids for survey and excavation. A Leica right angle square[44] was later incorporated to establish precise 90° and 180° measurements, specifically on hilltop and cairn sites. Linear measuring was conducted with 5 meter, 15 meter, 50 meter, and 100 meter fiberglass tape measures, and materials, including items such as graph paper, pencils, and rulers, were carried in the field by small rucksacks. Only one cave visited, Jakasova spilja, required extensive use of flashlights and speleological lamps.

Heavy brush was cleared from footpaths and sites using either a machete or *kosor*[45]. In most cases, the vegetation at a given site was not impacted or destroyed in any manner unless it was completely necessary. In the few cases where sub-surface testing was conducted, Marshalltown pointing trowels and small hand picks were used. Dry screening of the excavated materials was facilitated by a locally built 5 mm grid screen with wood frame, and soils were hauled to the screen (on-site) via a halved 40 liter plastic water container. Both screen and plastic container were then adapted to fit a small pack frame for transport in the field.

7.7.4 Photographic Records

Color slides as well as black and white negative film were used to record the survey and associated materials. On numerous occasions, heavy vegetation did not allow any revealing photos to be taken of the site. However, under most conditions, photo records were taken. Black and white films were both processed and printed in the

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[43] For further information on use of the Brunton Pocket Transit, see Whitley 1989: 13-21.

[44] See Leach (1994: 9) for a brief description of the archaeological applications of a right angle square, or *Winkelspiegel*.

[45] A *kosor* is a locally manufactured hand tool; somewhat of a cross between an axe and a sickle.

Arheološki muzej photo laboratory, and a general photo logbook was maintained for records. Photographic equipment used in the field consisted of one Leica M6 with either 50 mm-2.0 or 35 mm-1.4 lens, while a Nikon FM2 camera with various adaptive lenses was used for both museum and field work[46].

7.7.5 Transportation and Field Vehicle

Transportation to various localities on the island was facilitated through numerous methods. The island's bus system was used on numerous occasions to get from one end of the island to the other. Various family vehicles were borrowed from residents of Vela Luka, including those belonging to Prof. Dinko Radić and Aldo Mirošević. Asja Zec also allowed the team to use her car during part of the 1995-1996 seasons. On most occasions, two-person survey was conducted with the use of a BMW R 100 GS/ PD duel purpose motorcycle with a 35-liter fuel tank. This proved to be an extremely cost effective and efficient means of transportation across the island's terrain, especially when fuel on the island was in short supply during the regional conflict. With the panniers attached, all the necessary equipment could be hauled to the general survey localities. Many areas can only accessed by dirt road or similar type track, but it has been noted that it is precisely these types of localities that can reveal some of the most valuable and undisturbed archaeological data (Dillon 1989: 69).

Archaeologists have written little about the use of small boats as a logistical aid to field research. Indeed, archaeologists devote little thought to water transportation as many do not have the need. However, in certain cases, the use of water transport can save time as well as money (Meighan and Dillon 1989: 113). Seabourne travel to certain archaeological localities, such as the islets or remote shoreline localities on Korčula, was facilitated by small diesel or outboard motor boats, supplied by either Aldo Mirošević (Vela Luka) or Neven Fazinić (Korčula town). At least six archaeological sites were surveyed in this manner.

7.8 Field Data Collection

Archaeological survey is often recognized as the first step needed in greater archaeological studies and projects (Joukowsky 1980: 65). The field survey for this research used a number of recognized archaeological sampling techniques, as well as some more hybrid methods. An estimated 120 days were dedicated to the terrain of Korčula for the field survey phase of the thesis research.

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[46] All specialized photographic work such as macro and telephoto shots were done with the equipment and kind assistance of Aldo Mirošević (Vela Luka).

The various approaches were always employed in a calculated manner, but much of the work on a project of such small scale (and limited funding) depended on the availability of proficient fieldwalkers with reasonable archaeological backgrounds. When no fieldworkers were available, previously known archaeological sites were visited, spot checks on specific areas were conducted, or villagers were consulted about finds from their properties. No more than 5 archaeological field surveyors were used at any one time throughout the research for this thesis, with the usual field survey crew consisting of 2-3 people.

It is clear, given the many limiting factors, that the fieldwork had to be realistic in scope yet orchestrated in such a way that the needs of the research could still be met. In order to establish a good overview of the various aspects of the island's archaeological landscape, different methods of field data collection were employed. They were as follows:

1. Surface reconnaissance survey across specific sections of the landscape, including survey of nearby islets.
2. Reconnaissance and assessment of previously known archaeological sites.
3. Specific survey of hilltops across the island.
4. Limited sub-surface tests and excavations.
5. Basic underwater survey.

7.8.1 General Surface Reconnaissance Survey

Numerous variations of systematic survey were used during the thesis research. Since prior landscape survey had never been conducted on Korčula, it was necessary to obtain representative samples across the entire island for a reliable assessment of the archaeology and its potential. Areas were selected across the entire island for systematic field walking (see fig. 91), including many of the islets in the Pelješac Channel.

Localities were selected based on both random and stratified basis. In many areas, it was virtually impossible to conduct reliable field transects due to the extensive vegetational coverage. As mentioned previously, the *makija* cover in some spots is so dense that the only technique that can reasonably be used for survey is crawling through the underbrush. For survey on an island as big as Korčula, this method can be exhausting and time consuming. Nevertheless, in some cases this was applied. Other areas, such as field systems, were surveyed with the field walkers making transects across the area. The type and size of transects used depended on the availability of surveyors for that day. In most cases, only grab samples were taken to represent the

general nature of the scatter, since complete systematic collection was outside the capabilities of this research. Specifically, the focus was more on detection than total assessment.

Certain areas such as active vineyards were avoided. When these were encountered, a random field survey was made over the accessible lands near the vineyards to gather any information available. Locals have been consulted as often as possible regarding finds from these areas. In the Sitnica field due northwest of the village Smokvica, numerous materials such as a polished stone axe, debitage and microliths have been found, either by accidental find or random survey. The grapes in that area are for the well-known Pošip wine, so the farmers generally do not allow survey during the summer months when the grapes are nearly ripe. It is clear that through random survey of the area, enough evidence was detected to indicate the need for future stratified survey.

Artifacts were only collected in certain circumstances. As discussed in Chapter 6, many Early Bronze through Late Iron Age wares are very undiagnostic along the Dalmatian Coast and islands, so a selective approach was applied in the hope that when more light is shed on this issue, certain materials will already be available for analysis. Typologically diagnostic (or potentially diagnostic) pottery fragments such as handles, rims and larger body sherds were collected. Likewise, any temporally diagnostic artifacts, such as Hellenistic or Gnathia polished black ware fragments, Late Neolithic Hvar pottery, or Eneolithic pottery fragments (see fig. 48) were collected. Pottery or other diagnostic artifacts that appeared to run the immediate risk of environmental, agricultural, or pedestrian impact, were also collected. Finally, all lithic materials were collected from all sites surveyed. This included granite pestles from Roman *villae rusticae*, mortar fragments from Bronze Age hilltop structures, blade and blade fragments, Mesolithic scrapers and similar finds. Due to the fact that Korčula has no known lithic sources (except for the ever-present limestone), it is vital to collect such materials for future analysis.

7.8.2 Reconnaissance of Known Archaeological Sites

The survey also attempted to cover all sites known prior to the thesis research. Except for a few isolated limestone cairns and certain documented Roman *villae rusticae*, all previously known sites were surveyed. During survey in areas with previously known sites, the author and the KARG discovered many sites that had gone undetected before this research. The known sites were also documented on the field record forms, field plans made, if necessary, and were entered into the database.

Many sites had numerous follow-up visits over the course four research seasons. Certain localities, such as the cave known as Jakasova spilja (KZ-013), were visited on numerous occasions, not only to assess the archaeological and environmental situation, but also to study the impact people have made. Sites with artifact transport due the annual erosion processes, such as the northern shore of the Lumbarda polje (Bili žal), were visited as often as once each season to observe the natural environmental forces acting on the archaeological material (see plate 1). The cave known as Vela spilja was visited up to six times during some seasons to investigate and document the impact to the site by local children and general visitors.

7.8.3 The Hilltop Survey with Human-Based GIS

Given the amount of prehistoric hilltop structures recently recorded on adjacent islands (see Gaffney and Stančič 1991, and Forenbaher et al. 1994: 13-52, Čače et al. 1995), a systematic hilltop survey was planned and executed across most of Korčula. As will be detailed later, various types of spatial analysis have a primary role in the study of past human use and control of the landscape. In certain circumstances, islands can be seen as ideal landscape study areas since they have quite defined geographical boundaries, often in both prehistoric as well as modern times. However, since a GIS was not available for the research, other means had to be devised to conduct a viewshed-type survey.

Once again, Korčula's geography permitted a rather unconventional approach to be applied with decent results[47] . The first step was to go to the top of the Hum hilltop (site KV-003) at the western end of Korčula. This hilltop offers excellent views across roughly one third of the island's landscape (see Chapter 2). From that position, all known prehistoric hilltop structures in view (as of 1993) were identified (KB-017, KB-003, and KV-006). These known sites were then visited, and from those positions, all hilltops clearly (or suspiciously) in the viewshed were identified. Survey was conducted on those hilltops, and when prehistoric remains of some kind were discovered, a viewshed was again observed from that position to other unsurveyed hilltops. This "leap frog" type survey technique was applied across most of the island with quite remarkable results (see fig. 71). There is obviously some intuition involved in this approach which would incorporate biases which in turn could affect the results. To alleviate this scenario, most hilltops seen in the various viewsheds were surveyed, regardless of whether they looked "suspicious" or not, hence minimizing the tendency of bias towards certain types of "ideal" geographical settings. As will be discussed in the next chapter,

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[47] This human based GIS, or "poor archaeologist's GIS", was also discussed in the recent VAHD journal article by Bass and Radić (1996 in press: a).

the inter-site visibility from these hilltops discovered during this phase of the research was quite astounding.

7.8.4 Sub-Surface Testing

Regular trench-type excavations were well out of the scope of this thesis research, although there are definite future plans for excavations based on the results of the survey. In any case, controlled test units were used at a few sites, mainly to examine sub-surface soil and artifact integrity in various geographical settings. The units were usually 1m. X 1m. and all were terminated at major geological barriers or bedrock. A screen with 5-mm mesh was built by Aldo Mirošević and used for dry sieving the excavated materials. Controlled tests such as these can yield important data on the various geomorphological and anthropogenic processes and their effects on typical archaeological contexts, yet the impact to the site is contained due to the small scale of the sounding.

7.8.5 The Application of Snorkel Survey in Shallow Bays

The use of mask, snorkel, and fins, for transect survey in shallow bays proved to yield positive results. Compressed air cylinders and proper SCUBA equipment was out of the scope of this research, but systematic surface survey was easily facilitated by regular skin diving equipment. The areas surveyed included some of the smaller bays where transect survey on the surface was both safe and reasonably accurate. Underwater visibility around Korčula in the summer months is usually from 15 to 30 meters. Factors affecting the visibility, depending on the area, can consist of local marine plant life, the type of bottom (sand, rock, or sea grasses), wave action, and the tidal effects. In most cases, it was possible to swim using markers on the shore and natural submerged features for proper transect bearings. Once artifacts were spotted from the surface, breath hold dives were made to retrieve the materials for closer inspection.

Chapter Eight

The Results of the Survey: Mesolithic to Eneolithic

8.0 General Synthesis of the Survey Finds

Before specific scrutiny of the archaeological and related materials can be applied to the body of evidence collected for this research, it is necessary to summarize the overall data profile of the archaeological record on Korčula. To simplify the presentation, pertinent information will be detailed in a period-specific manner. Since convincing evidence from the Palaeolithic has yet to be found on Korčula, this period will be excluded from the following discussion. Finally, the results of specialized analysis that relate to the archaeological record will be detailed.

8.1 The General Archaeological Data Profile

It is outside the scope of this thesis to discuss all of the various aspects of the evidence that has been collected and entered into the database. However, a general overview will be given which highlights some of the more pertinent fields found in the database. Figure 22 details the basic codes used in the field that handles the various aspects of each site. Other systems have been used recently on neighboring islands (cf. AIP, Gaffney et al. 1997), but it would not take much effort to make the systems compatible. It should also be noted that due to the constraints of time and workforce, the author established many of the basic codes for the "site aspects/ type" field as work progressed. Basically, some of the fields found on other databases from either the aforementioned AIP or the Hvar Project (e.g. Grossman 1989; Gaffney and Stančič 1991: 90-96) are not found in the author's database. This should only reflect the fact that these site aspects or types were not encountered and hence are not represented in the computer database. Time permitting, the system could be streamlined.

Likewise, it was noted that the process of data collection, recording, processing, and final entry into the computer database had many redundancies. Figure 23 shows the general pattern of the research, from the data collection to the final products (of which this thesis is one). The main area of overlap occurs between the data recorded on the field form (in the field) and the re-entry of this data into the computer database. It would be much easier to take the paper-version of the field forms completely out of the data collection loop. The author attempted to use a laptop computer for field data entry, but the unit was not very robust and hence the venture did not succeed.

New generation portables, which are both waterproof, dustproof, and ruggedized against drops would be the way to proceed. At the end of the day, the paper reports can

still be printed out and archived at the Arheološki muzej in Vela Luka. Meanwhile, the time consuming process of transferring all aspects of the field form data to the computerized version, which essentially has the same format, could be avoided. Likewise, problems that can frequently occur on low-budget projects, such as running out of paper forms while in the field, can be eliminated. Finally, a unit like the one described above can be used in all weather conditions, unlike the paper, so that winter survey and fieldwork could proceed.

Figure 60 displays the nature of some of the more important aspects of the database. It is perhaps important to point out the potential that still remains for field data collection on Korčula through various means of survey. It has recently been noted that on the island of Hvar, prior to 1982 and the numerous projects that followed, there were roughly 250 known archaeological sites. As the latest publication goes to press, there are now over 800 sites documented on that island (Franičević, in Gaffney et al. 1997: ii). When the major types of sites documented from all periods on the island are taken into account (monuments, single finds, etc.), then it is clear that Korčula still has a long way to go. The author has tried to incorporate all known data, although some categories, such as Medieval or Venetian-era sites, are not well accounted for in the database. This could be due to the patchy nature of the published details concerning these periods and the fact that, admittedly, the focus of this thesis was on the prehistoric and protohistoric aspects of the island.

However, it is apparent that the proper groundwork has been laid for future research. As will be clear in the following chapters, certain aspects of the data are still in need of more quantitative support. With the proper research designs prepared with this thesis as the foundation, and with a good team and adequate funding, it will be possible to expand the research in a systematic and purposeful manner.

8.2 The Mesolithic Evidence on Korčula:

The Mesolithic aspects of Korčula have never been explored in any published format. Perhaps the primary reason for this is the lack of definitive materials from Korčula which could be temporally assigned to the so-called Mesolithic. However, the period cannot be overlooked due to the nature of certain previous archaeological discoveries from the island and more recently, specific finds attributed to this thesis research.

8.2.1 The Mesolithic Indications in Vela Spilja

As previously mentioned, the primary source of archaeological data from the island, prior to the author's work, can generally be attributed to the finds from the Vela spilja excavations briefly detailed in section 5.3.4. Čečuk discussed the presence of two

juvenile burials (2-4 years of age), discovered during fairly recent excavations in the cave and noted that below the Impresso pottery stratum there was a ca. 80 cm thick layer in which only animal bones, snails and shells were found, as well as occasional flint products. Not a single piece of pottery was found in this stratum, and as Čečuk concluded, this was a layer *without* pottery (author's emphasis). At the base of this stratum, 20 cm above the bedrock, two skeletons in contracted positions were found, poorly preserved, surrounded by stones and cobbles that tend to indicate a grave construction. Finally, the bones of a bird were discovered in direct association with one of the burials (the avian remains were buried next to the juvenile) (Čečuk 1989: 44).

Prof. Dinko Radić, who was present during the excavations (pers. com.) has given the general details of the archaeological situation in this section of the cave to the author. However, since no extensive plans of the cave's stratigraphy have been published and nothing pertaining specifically to these burials or the associated stratigraphy is currently accessible, the situation is far from clear. Therefore, sorting out the source of the occupational materials found below the earliest Impresso stratum is problematic at best.

Čečuk has been quite conservative in the description and assessment of these lower cultural strata in the cave. The sounding in which these remains were found is not terribly large (ca. 2 m. x 5. m.) and apparently most of the finds were indicative of a particular occupational sequence. Nearly all cave occupations on the Dalmatian islands and the immediate coast reveal various types of seashells, land snails, and lithics that cannot always be assigned to a particular cultural occupation without diagnostic pottery. Therefore, without these diagnostic artifacts, Čečuk's restraint is essentially well founded.

Two basic scenarios could be possible, with one more convincing than the other, for a preliminary assessment of this early cultural stratigraphy from Vela spilja. The first situation would involve an intrusion into the sterile pedologic strata below the Early Neolithic cultural layer during the Early Neolithic occupations in the cave. The pit for the burial of the two juveniles would have been dug below the Early Impresso stratum, the individuals would have been interred, and materials would then have been used as filler for the burial. This could account for the midden-type materials found during the excavation such as seashells, snails, and miscellaneous animal bones. In this case, the burials would be contemporaneous with the Early Neolithic.

The stones and cobbles used to prepare the grave are also found in a natural pedologic horizon which deposited into the cave sometime towards the end of the Impresso (Early Neolithic) occupations. This horizon is visible elsewhere in the cave where previously excavated profiles are still visible. These cobbles and "stones" would therefore have been available as source materials either outside the cave or in the

immediate vicinity. This fact is not necessarily revealing, since limestone breccia is quite abundant even today, although true "cobbles" are rarely found on Korčula's landscape.

Even though this scenario appears to be relatively convincing, it seems highly suspicious to find lithic materials used as burial "filler" in an extremely lithic-scarce region. Unfortunately, there are no other Early Neolithic burials, either on the Dalmatian Coast or the islands, which can serve as comparisons regarding the methods of burial or associated cultural grave goods. The only in situ Neolithic burials known from Dalmatia are from the Late Neolithic levels of Vela spilja, and the few lithics associated with these are found directly adjacent to, and associated with, the skeletons.

Even if a ceremonial deposition of the lithics occurred into the grave pit containing the two Early Neolithic graves, it is equally suspect that not one sherd of Impresso pottery was found in the filler. These fragments would have been quite abundant in and around the cave, judging from the large assemblage of sherds collected from the cultural horizons contemporaneous with these Early Neolithic burials. Therefore, the theory that these two juvenile burials are associated with the Early Neolithic is not conclusive.

The second scenario describes the horizons which contained no pottery, situated below the earliest Neolithic Impresso deposit, as predating the Early Neolithic. These strata which contained seashells, snails, and a few lithics (unfortunately, the material and typology of these lithic finds has not been offered) would be assigned to a pre-pottery occupation in the cave. In the traditional sense, this would then imply a Mesolithic occupation.

The sounding in which these materials were found is rather small but extends deeper into the cave's sediments than any other excavation in Vela spilja. Coupled with the fact that a sterile cave deposit has not been clearly identified in the lowest levels of current excavations elsewhere in the cave, it is probable that Mesolithic occupations occurred in the cave but that associated materials have only just been detected in the small sounding described above.

Due to the fact that the bulk of the materials from Vela spilja have only been published in brief overviews, situations such as the one explored above remain quite speculatory. Perhaps the only facts that seem clear are the deliberately constructed burial of these individuals and the purposefully placed avian bones next to one of the bodies. If the latter stratigraphic situation is correct, then these juvenile burials in a maritime Mesolithic context warrant a thorough review. Hopefully, this situation can be clarified in the future.

8.2.2 Mesolithic Evidence from the Survey

The field survey for this research has only yielded two artifacts that might be assigned to the Mesolithic. Consequently, only 2 Mesolithic sites can be appointed to the overall archaeological database established on Korčula for the author's research. This very poor showing can be attributed to a number of factors. Naturally, there might have been no Mesolithic occupations on the island[48] and this would rule out the presence of associated artifacts. However, Mesolithic and Epi-Palaeolithic sites are known from the current islands and the immediate coast (cf. Mirosavljević 1970: 47-56; Čečuk 1986b; Čečuk 1986c; Čečuk 1992; Chapman and Müller 1990), so the few Mesolithic finds from Korčula do have substantiated evidence elsewhere in the immediate region.

The lithic surface find at KP-019 was revealed during general transect survey on the inactive sections of the Krušev dol field. The end scraper (see figure 49) does have correlates in regional Mesolithic tool kits, such as those known from the Lepenski Vir Culture in the Iron Gates region of the Danube river valley (e.g. the Vlasac site; Letica 1969: cf.-pl. III, fig. 5) and closer to the coast, in the Odmut Cave Mesolithic assemblage from Layer Ib, which is assigned to the so-called Late Mesolithic (Srejović 1974: 5, cf.-pl. II, fig. 7). Likewise, artifacts from the "late Palaeolithic" Grava shelter on Corfu have some correlation (Sordinas 1968: 417-418).

The material type, consisting of a brownish-red chert (possibly radiolarite) with a reddish cortex visible on the left ventral side of the artifact, is not represented in the large lithic assemblage from Korčula's Vela spilja nor has this material been found at any other site on Korčula. A possible correlate regarding this material type, based on color and general description, exists in the well published assemblages from Franchthi Cave, Greece (Jacobsen 1973: 72, 76). Likewise, the artifact's typology (steeply retouched end-scraper) also has a general correlate in the Franchthi Mesolithic tool kit (op. cit. 75, 77-78). The cortex tends to indicate that the tool was manufactured directly from a core preparation flake/ blade.

The Mesolithic evidence from the KS-008 site was detected in the Sitnica polje, northwest of the village of Smokvica. The bulk of the materials found at this site were scattered throughout the horizons exposed in a JCB trench, so the exact provenance of this find is rather problematic. The find with Mesolithic connections consists of a finely retouched backed bladelet (see fig. 49, KS-008). Although this tool is also common in some Upper Palaeolithic or Epi Palaeolithic assemblages, the find has been assigned to the Mesolithic until alternate evidence indicates an earlier period.

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[48] The nature of the palaeo-coastline along the Eastern Adriatic seaboard and how it relates to the present islands and the overall archaeological record is not well detailed in the literature and is rarely discussed.

The artifact appears to have associations with a standard microlithic-based tool kit, although this is only a preliminary assessment. The lithic material, in this case consisting of a light brown to yellow-colored fine grained chert, has also not been identified in the vast assemblage from the Neolithic levels in Vela spilja nor at any other site on the island. This could be significant given the lack of flint resources in the region and the fact that there appears to be some consistency in the source materials from the Neolithic assemblage from Vela spilja.

Regarding the tool typology, a few associations can be made to finds at regional sites such as Odmut Cave, in Level Ia (Srejović 1974: 4, pl. 1, fig 16) and possibly to the Epi-Palaeolithic/ Mesolithic finds from Kopačina spilja on the island of Brać (Čečuk 1992: 39-40). However, in both of these cases, the artifact illustrations are not accompanied by a scale, so the size comparisons to the find from KS-008 are not clear (e.g. microlithic versus non-microlithic assemblage). Once again, clear typological connections can be found with the Lepenski Vir Culture, such as the backed bladelets from Vlasac (Letica 1969: e.g. pl. I, figs. 18-19), and finds from the Epi-Palaeolithic and Mesolithic cultural occupations in Franchthi cave, Greece (Jacobsen 1973: 74, 78).

Finally, it is apparent that there is a general lack of the so-called Mesolithic sites along the Dalmatian Coast. As the limited data from Korčula would suggest, this could very well be due to the inundation of the lowlands with soils, specifically after the onset of widespread agriculture. Researchers involved with the Neothermal Dalmatia Project (NDP)[49] pointed out that due to the bias against finding Mesolithic sites, survey results tend to suggest that the Early Neolithic farmers were walking onto an apparent deserted landscape (Chapman and Batović 1985; Chapman et al. 1987; Chapman et al. 1990: 31). It is hard to believe that this would have been the case, specifically in light of the few sites with occupations that are almost consecutive (cf. Odmut, Lepenski Vir, possibly Vela spilja). Therefore, the NDP team is correct in indicating that until the neglected lowland Mesolithic is researched properly, the apparent imbalance will continue to indicate the arrival of Early Neolithic farmers on untouched terrain (ibid.).

8.3 The Neolithic Evidence from Korčula

There are only 4 *confirmed* (author's emphasis) Neolithic sites on Korčula, according to the database compiled by this thesis research and past archaeological investigations. As discussed in Chapter 5, various investigations have lead past historians, archaeologists, and enthusiasts to speculate as to the potential evidence which could be revealed in many of Korčula's caves. However, it should be pointed out

[49] Conducted in the Zadar lowlands and nearby Velebit (Dinaric) mountain range.

that the sites mentioned in this section are only those confirmed by the author or the members of the KARG.

The island does have a potential for intensive investigations into the prehistoric uses of caves and rock shelters in light of at least 115 geological phenomena of the type which have been documented on the island (Božičević 1960; Božičević 1972: 209-214). The KARG plans to investigate and assess these sites for any archaeological potential. Finally, a note should be made concerning various lithic finds that do not appear to have a direct temporal association. Grga Novak (1955: 305) noted this phenomenon, specifically relating to the Dalmatian Coast and the presence of numerous rough lithic artifacts that are temporally undiagnostic. Many of these artifacts found during this research have been illustrated such as some of the finds from KL-003/ Bili žal (see fig. 49). Hopefully, these can be assigned to specific assemblages during future investigations on the island.

8.3.1 The Neolithic Evidence from Vela Spilja: Insights

A complete discussion of the Neolithic materials from Vela spilja is beyond the scope of this thesis. In Section 5.3.4, the general archaeological aspects of this cave site were detailed and the main bibliographic references were given. However, it is appropriate in this section to expand on specific archaeological materials from the cave and how they relate to the regional archaeological framework throughout the Neolithic.

A summary of the Neolithic pottery dating from the Early Neolithic through to the Eneolithic in Vela spilja has been recently published (Čečuk and Radić 1995). These materials have also been reviewed by the author, with permission granted by Prof. Radić, and will serve as the basis for the following discussion. The author has researched many aspects of the Vela Luka finds outside of the aforementioned text and materials. However, with regards to the overall Neolithic picture presented by Čečuk (cf. 1980; 1986a; 1989a; 1992) or Čečuk and Radić (1995), the site will maintain its general archaeological and chronological profile, but the regional perspective will be expanded.[50]

As mentioned in Section 6.3.1, the Early Neolithic pottery specific to the Dalmatian Coast and the adjacent islands has been traditionally broken down into three phases (e.g. Batović 1966). This system more or less conforms to the general pan-Mediterranean Impresso scenario (see Guilaine 1979), although the painted wares associated with the Impresso elsewhere such as Southern Italy (Whitehouse 1968: 188-

[50] It should be mentioned that since the materials have only published in a general manner (dating back to the first 1954 excavations) the author has agreed with both Dr. Čečuk and Prof. Radić not to publish or detail any specific aspects of the materials which fall outside the published body of information. The exception to this is the XRF and XRD analysis conducted on some of the pottery from Vela spilja, where full permission was granted to conduct these investigations.

193; Whitehouse 1969: 277-280; Sargent 1985), are not present. However, the chronology is fairly localized on the East Adriatic in that many phases are clearly evident in the Dalmatian assemblages and less prevalent or completely absent in the regional picture. Therefore, as discussed in Section 6.3, Müller's Early Neolithic typology and phase sequences (1988; 1994), that are specific to the Dalmatian Coast, will be used here.

The Impresso A pottery, recognized as the first phase of the Early Neolithic ceramic developmental sequence on the Dalmatian Coast, is evidenced in Vela spilja. The various motifs on this pottery, as represented on figure 34, constitute the simplest and earliest designs found on the Impresso wares. It should be mentioned that there are also numerous sherds of Impresso associated wares which are undecorated (non-impressed) but contain the same fabric, inclusions, and general vessel shapes.

Čečuk and Radić (1995: 9-15) have detailed three phases of Impresso pottery (op. cit. 9-10). These correspond directly to the Impresso A, Impresso B, and Impresso Tremolo phases that are illustrated in figure 34. The chronological picture in Vela spilja can take on a new aspect in light of the "Danilo A", or final Impresso phase, detailed in Section 6.3.1. The Čečuk and Radić text displays the final pottery fragments from the 3rd or Impresso Tremolo phase as typified by incised sherds, some with lines and triangles, and filled small impressions (op. cit. 11). These are clearly the Danilo A typology which would post-date the Impresso Tremolo as shown at other Dalmatian sites such as Škarin Samograd (Batović 1966: 86-88, 96-98; Müller 1988: 231-232, Gudnja Pećina (Chapman 1988: 8) and Pokrovnik (Karg and Müller 1990: 376-377).

The presence of this pottery indicates a transitional stage, in terms of the pottery motifs, from the Impresso style to the Danilo style. The more important cultural aspects suggest a continuous development, implying a gradual, constant, yet local procession, of the local Neolithic along the eastern Adriatic seaboard. Furthermore, regarding the pan-Adriatic picture, a few sherds of Danilo pottery, some clearly the Danilo A type, are known from the Italian coastal site at Ripoli (e.g. Cremonesi 1965: 130-131). At least two of these sherds (ibid. figs. 2 and 4) clearly match the Danilo A triangle motif fragments from Vela spilja (see Čečuk and Radić 1995: 15, fig. A 21) and give support not only to trans-Adriatic trade theories (discussed in Section 6.4), but also tend to confirm the origins of the pottery from the East Adriatic. Finally, the fact should not be overlooked that Vela spilja, above the bay of Vela Luka, is directly adjacent to the Ripoli site on the opposite Italian Adriatic seaboard.

The preliminary information concerning the faunal remains specifically associated to the Early Neolithic levels in Vela spilja is limited in the published form (see Čečuk and Radić 1995: 11) and no quantified analysis has occurred. The remains

which have been assigned to the Early Neolithic are primarily wild varieties including wild boar, wild dog, wild cow (auroch), and avian, with domesticate evidence restricted to ovicaprids. Figure 36 has outlined the terrestrial and marine faunal remains from Vela spilja, including the Latin names and the common names often found in the Croatian literature. Generally, the ovicaprid and wild species profile adheres to the few Early Neolithic economies that are known from the Dalmatian Coast (Batović 1966; Chapman et al. 1990: 36; Chapman and Müller 1990).

Other finds from the Early Neolithic of Vela spilja that deserve mention here are the presence of polished axes. These might have some association, regarding source materials, with the Odmut Cave lithics from Levels Ia/ Ib (see Marković 1974) and possibly Gudnja pećina, although the latter site's materials are unpublished. Two jadeite polished axe pendants from the Early Neolithic levels in Vela spilja are worth note (Čečuk 1989a: 45). One measures a mere 4 cm. in length by 0.27 cm. in width, perforated on the blunt end, and possibly served as an amulet of some kind. This pendant is a miniature replica of the standard sized polished axes and appears to be of the similar "greenish stone" material described in the last section, including the tongue-shaped axe found on Korčula, near Smokvica village, although this still needs to be verified. An axe fragment of a similar material have also been collected by Prof. D. Radić during the excavations in the Early Neolithic levels in Vela spilja. The fragment, consisting of a flake accidentally fractured off the leading edge of a greenish stone axe, is clearly of a similar lithic material. However, it should be noted that there are no jadeite axe finds from the Dalmatian Coast. Given the general rarity of jadeite finds in the area and the fact that the nearest sources are in northwest Italy (see Barfield 1981), it can be assumed that the small charms or pendants from Vela spilja were indeed special objects.

The pierced pendant takes on a distinctly local cultural aspect when viewed in light of the standard-sized axes known from Vela spilja. This could suggest a more personal and individual association to some of the stone tools found in the Early Neolithic tool kit. Perhaps the most peculiar aspect of the pendant is the fact that there is evidence of very slight use wear at numerous points along the miniature axe's edge. Perhaps a certain individual used the pendant itself in some capacity.

An overview of the Middle Neolithic of Dalmatia and the immediate region has been given in Section 6.6. As briefly mentioned in Section 6.6.1, Čečuk has identified a local variant of the Danilo Culture painted wares in Vela spilja that has been called the Vela Luka Culture (see Čečuk 1986 and Čečuk and Radić 1995: 17-23). The argument for a localized island population during the Middle Neolithic with its own distinct cultural attributes is convincing enough.

The standard Danilo incised and burnished spiral motif is present in the Vela spilja assemblage, as is the so-called salt pot (see fig. 35), and the basic bichrome painted wares. However, there is a clear departure from the standard forms in the Vela spilja assemblage. Many bichrome vessels are painted with very fine lines and include patterns which, although similar to the Danilo, are only noticed in Vela spilja. These include variations on the spiral, painted geometric shapes (triangles, rhomboids, etc.) with alternating painted and unpainted sections, variations of the painted checker-board motifs, and random parallel lines which connect to form abstract geometric shapes. As mentioned in Section 6.3.2, certain fragments of the painted pottery from the Middle Neolithic levels in Vela spilja show distinct connections to the Serra d' Alta wares known from the Italian Middle Neolithic. Once again, these contacts definitely need more investigation regarding the nature and implications of trans-Adriatic cultural contact during the Middle Neolithic.

Sections 5.3.4 and 6.7.1 have presented both the overview of the Late Neolithic on the Dalmatian Coast and the main materials known from Vela spilja. The presence of the two in situ burials during the Late Neolithic Hvar Culture occupation (Čečuk 1986: 47; Čečuk and Radić 1995: 34-35) requires further research, specifically regarding pathologies such as the so-called radiopaque transverse lines[51] of the long bones which occur from illness, acute malnutrition, or dietary deficiencies (Harris 1931; Driezen et al. 1964: 295-306)[52] . Likewise, some marine resources require diving to collect the shells even at the low tide mark (e.g. certain *Spondylus sp.*), so pathologies such as external auditory porosis (diver's ear) might arise. These manifestations would indicate very specific cultural patterns and activities that can only add much needed insight into the Late Neolithic of the Dalmatian islands and coast.

Čečuk (1989: 46) has pointed out that the Late Neolithic Hvar Culture pottery from Vela spilja also has stylistic variations when compared to the Hvar type-site pottery (cf. Novak 1955), once again implying inter-island variations of a similar cultural group. Some of the motifs that appear to suggest this are detailed by Čečuk and Radić (1995: 24-35). Concerning the blue water fishing capabilities of the Hvar Culture group associated with Vela spilja, both dolphin and swordfish remains have been recovered which indicate a very specialized marine resource exploitation (see fig. 36). While most of the shellfish finds correspond to those from Grapčeva spilja on the island of Hvar (Novak 1955: 345-346), the presence of open and deep water species adds a different dimension. Other aspects of the palaeoeconomy, which appear to be significant, concern the presence of numerous wild bird species in the faunal assemblage which include

[51] Also known as "Harris Lines", "bone scars", or "arrested growth lines".
[52] See Tartaglia (1989: 44-54) for a good overview of applied radiopaque transverse line study in archaeology.

pheasant, magpie, and crow. However, birds that tend to frequent estuaries such as herons, egrets, and duck are also present. Connections to the nearby Blatsko polje, which until recent times was wetlands, cannot be overlooked. These latter finds definitely indicate a very broad base for natural resource exploitations during the Late Neolithic on Korčula.

8.3.2 Neolithic Evidence from the Survey

The introduction to Section 8.2 details the problematical issues involved with assigning a temporal reference to many of the lithic finds from the survey. These include many of the finds from the shoreline at Bili žal (KL-003), the Smokviška Sitnica (KS-008), the Pupnat area (KP-025), the Istruga Bay cave (KS-026), and the Sutvara prehistoric hilltop structure (KS-007) (see fig 49). Sedimentation plays a major role in obscuring the earlier occupational evidence on Korčula. Due to the heavy anthropogenic factors that consequently facilitate soil transport, it is highly likely that there are more lowland Neolithic sites, not simply isolates or find spots.

Review of the data base shows that 3 of the 4 confirmed Neolithic sites are caves sites (KV-012, KP-015, and KZ-013), while the 4th is a lowland site on the islet of Badija (KK-005) situated off Korčula's eastern shores. Figure 53 illustrates the temporal archaeological evidence and geographical setting at each of these sites. Clearly, the number of sites is not high enough to permit any specific statistical analysis. Likewise, the profile should not be seen to suggest the tendency for Neolithic cave occupation

over open site or lowland occupation.

Only one Neolithic site, the cave known as Jakasova spilja, was archaeologically investigated during this thesis research[53] . The situation at this site is by no means completely understood. Previous investigations have included the speleological investigations of Marčić (1916: 170), Juraschek (1916: 170-171, 1916: 115), and later Girometta (1924: 120). It is Juraschek who emphasized the cave's prehistoric occupations, based solely on the presence of the pottery surface scatter. These observations were published long before regional Neolithic and Eneolithic chronologies were established or local cultures known (i.e. Hvar Culture, Vela Luka Culture, Danilo, etc.).

The main archaeological exploration did not occur until the early 1950s by Novak (1954: 44-45). Gjivoje reviewed the finds (1969: 38-39), but it is Čečuk who gives the best overall description of the cave, the brief explorations, and the general materials (Čečuk 1980: 25-34). Several small soundings, one near the entrance, one in the back of the first chamber, and one in the middle of the second, have been dug by the aforementioned archaeologists. A bit of confusion does exist as it is not entirely clear who has dug what sounding. The excavation units were all quite small (ca. 50 cm. x 50 cm. x 60 cm in depth), and it does not appear that any systematic sampling took place. Artificial light is required after the first few meters into the cave, so a proper excavation would need specific logistical assistance.

During the author's visits, many of the pot sherds on the floor of the cave were found to be encrusted with a thin calcareous layer which is derived from the calcium which leaches from the limestone around the cave. This process is normal in the karst regions. However, the rate of deposition appears to be quite slow in Jakasova spilja and Dr. Philippe Della Casa (University of Zürich, *Ur-und Frühgeschichte*, pers. com.) has suggested that the cave is undergoing a process of fossilization, hence the slower rate of deposition.

Numerous potsherds were sampled from the floor of the cave, but an attempt was made to maintain the site's archaeological integrity. Two small clusters of sherds appear to be *in situ* breakage on the cave floor. These positions were noted and the materials were collected. The last few years have seen numerous visitors to the cave. Unfortunately, these visits cannot be monitored, so the decision was made by the author to remove certain sherds when it appeared as though they were in danger of impact to the archaeological context (trampled, crushed, or relocated in the cave) or could be removed entirely.

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[53] Vela spilja has been visited dozens of times by the author. However, research and publication rights currently belong to Dr. Čečuk, hence this site was not "archaeologically" investigated.

Middle Neolithic (Vela Luka Culture painted pottery) was observed in the cave as well as numerous diagnostic Late Neolithic Hvar Culture pottery sherds. One sherd with incised motifs has been collected and illustrated (see fig. 48). Cultural material eroding from the sounding at the front of the cave was also collected, as this seemed to be a tempting target for the visitors to the cave. These finds included bone tools, ovicaprid remains, limpet shells, one lateral incisor (human), and one pestle (fig. 50).

The minor investigations into this cave, including the author's discovery of the Early Neolithic Impresso sherd in the finds stored in the Arheološki muzej, Vela Luka, give a new look to the cave's occupational history. It now is apparent that there is evidence which indicates limited use of the cave during the Early Neolithic, Middle Neolithic, Late Neolithic and Copper Age. Clearly, these investigations are only preliminary and the overall body of evidence is not large. But, it is possible at this point to disclose materials that show over 4000 years of cultural association with the cave.

8.4 Eneolithic Evidence from Korčula: Problems on the Adriatic Periphery

The specific problems relating to the Late Neolithic to Eneolithic transition are far from clear on the Dalmatian Coast. The problems concerning certain stylistic traits of the ceramic assemblage in the Late Neolithic Hvar Culture and their connections (or origins) elsewhere, in this case with the later Vinča Culture (Vinča C and D) from northern Serbia and northeast Bosnia, have previously been discussed (Dimitrijević 1970: 105-122). The pottery in question, the channeled (*kannelierten Keramik*) and polished wares, were later attributed to the Nakovanj Culture, which originates from the Pelješac Peninsula, opposite Korčula (Petrić 1976: 295-313).

Since the Pelješac Peninsula is also directly adjacent to the island of Hvar, a localized cultural contact (Hvar-Pelješac) is more probable than the long distance contacts suggested above. The argument that the Nakovanj is directly descendant from the slightly earlier Hvar Culture (Marijanović 1981), archaeologically supported by other recent finds on the Dalmatian Coast (Batović and Chapman 1986: 52-53)[54] , does have the best merit. The Nakovanj Culture (also referred to as the Pelješac Group) is widely accepted as either one of the three (Chapman et al. 1990: 39), or four (Della Casa 1995) regional cultural groups of Dalmatia during the Eneolithic.

The archaeological complications arise with the general lack of diagnostic pottery evidence for the Eneolithic outside of grave or cave contexts. The heavy emphasis on Montelius' periodization, a practice well entrenched in past Dalmatian archaeological studies, does not allow for anything but a general diagnosis on much of

[54] See the more extensive text covering Buković-Lastvine, including radiocarbon dates, in Chapman et al (1990); and Section 6.8, this text.

the Eneolithic through to Iron Age finds. It is then very difficult to "slot" the majority of finds into a solid temporal framework.

The problems involved with this scenario on the eastern Adriatic seaboard have been pointed out previously (Gaffney 1992: 129). Even earlier, Novak noted that copper objects would certainly have been no rarity in the Late Neolithic of the Dalmatian Coast (1955: 310). This is unsurprising, since copper ores and artifacts were long known to exist in the Late Neolithic Vinča Group, stemming from the type-site Vinča Belo-Brdo, situated near Belgrade, Serbia[55] . The irony though, once again established by Novak and still valid today, is the fact that very few copper objects (intrinsic to the Copper Age) have actually been found in Dalmatia (op. cit. 305). It is important to reiterate these problematic aspects which are well manifested in the Eneolithic west of the Dinaric Alps.

8.4.1 The Eneolithic from Vela Spilja

Once again, the best summary of the Eneolithic Vela spilja materials is found in the recent Čečuk and Radić publication (1995: 36-45), although references to the related assemblage have been referred to in other places (see Della Casa 1995: 566, 569-570; and the general overviews in Čečuk 1986a; Čečuk 1989a). Basically, three different types of ceramic assemblages can be discussed in Vela spilja which relate to the Eneolithic. The first two, the Nakovanj and the Adriatic variant if the Ljubljanski Culture, are from the known Dalmatian coast assemblages. The third, which are claimed by Čečuk and Radić as exclusive to Vela spilja, are the guttered or spouted wares (*žlijebljene keramike*).

The Nakovanj Culture wares, typically channeled perpendicular to the rim, and normally highly polished with a very dark brown or black color, are present in Vela spilja. Variants of these wares are found, such as the "S-shaped" rim profile, or groupings of vertically incised lines found on the shoulder of the vessels. The encrusted wares found in the cave are typical of the wares known from the Adriatic Variant of the Ljubljana Culture. These stamped, rolled, and incised wares, often encrusted with a white paint, are highly diagnostic.

Finally, Čečuk and Radić have detailed another type of pottery which, prior to the publication, was unknown in the Eastern Adriatic Eneolithic inventories. These wares, translated as guttered or spouted ceramics, could very well be a regional variant of the Cetina Culture, although not enough pieces have been examined or even discovered to determine if this is the case. The pottery has a combination of impressed

[55] The copper connections to this site have been known from at least 1908. However, the first large publication was not until Vasić (1936) with the *Preistoriska Vinča IV* (The Prehistoric Site of Vinča, IV), Beograd. See Jovanović and Ottaway (1976: 104-113) for a good overview of the associated sites, ore mining, artifacts, etc.

and incised motifs which appear to be vaguely similar to the Cetina group, although stylistic variations have permitted the Čečuk and Radić classification (see 1995: 37).

A copper shaft hole axe is attributed to the Eneolithic layers of Vela spilja (op. cit.: 45), but in general, minimal bronze artifacts are actually known from the cave. This corresponds to the scarcity of finds reported by Novak in the Eneolithic levels of Grapčeva spilja on the island of Hvar (1955: 310, 344-345). The axe is typical of the known early copper axes found throughout the region. Of note is the fact that many of these rather heavy tools (the Vela spilja example weighs a few grams short of one kilo) are clear copies of their slightly earlier stone counterparts (e.g. polished stone shaft hole axes and stone chisels). Hoards revealed at Pločnik (in Serbia) serve as the best examples of the connections between the stone and copper tools (see Jovanović and Ottaway 1976: 106).

A point to mention here, specifically regarding the presence of stone and copper tools of the same shape, are the finds from the former Dučilova Gomila, near the town of Blato on Korčula. Unfortunately, the whereabouts of the finds from this now destroyed limestone cairn are not known. In any case, Frano Radić and Vid-Vukasović described and illustrated some of the finds (1887: 106), including a shaft hole axe. It is hard to determine the exact typology or material from the illustration, but the find should not go unnoted

The urn burial recovered from the Copper Age levels of the cave (Čečuk and Radić 1995: 44) raises some interesting questions. The urn burials are generally associated with Copper and Bronze Age assemblages farther up the coast, more or less geographically starting in present Slovenia/ NW Croatia (Coles and Harding 1979: 447-448). The Vela spilja burial consists of a juvenile (partially cremated ?) who has been interred in a globular-shaped urn. The urn is not particularly diagnostic, but some of the nearby lithic finds do have connections to another site in the area.

A group of long flint blades is said to be associated with the burial. Unfortunately, the exact association to the burial itself is not clear from the Čečuk and Radić text. These could be from a nearby context not necessarily associated directly with the grave. The blades range from 9.9 cm. in length to 20.6 cm. in length (Čečuk and Radić 1995: 45) and appear to be of the same type of material and typology as the finds from the island of Badija, which range from 6.4 cm. in length to 25.4 cm. in length (op. cit. 43)[56].

It is interesting to note that the finds seem to represent a limited tool kit consisting of blades (no scrapers, burins, projectile points, etc. are known from the

[56] The Badija lithics are on permanent exhibit in the Muzej Korčule (Museum of Korčula), in the town of Korčula.

assemblage), and that these seem to fall into a rather specific lithic kit based entirely on long blades. Perhaps in the future, with the discovery of similar blades in well-stratified contexts, a statistical approach can be applied to support this observation. The preliminary details by Čečuk and Radić indicate that this burial might be associated with the aforementioned "gutter or spout" ceramic group of the Eneolithic from Vela spilja (1995: 37, 44). However, this is by no means conclusive given the very limited published details attached to this burial.

8.4.2 The Eneolithic Evidence from the Survey

During the 1996 summer season, Dr. Biljana Schmid-Sikimić (University of Zürich, *Ur-und Frühgeschichte*) assisted the author with the removal of diagnostic Eneolithic sherds which were being trampled on the footpath in the back of the first chamber in the aforementioned Jakasova spilja. These finds, which were pressed into the clay on the floor of the cave, are typical of the so-called Adriatic variant of the Ljubljanski Culture[57] (the "Adriatic type"). These sherds are the first evidence of this period which are now known from Jakasova spilja. One sherd, possibly burned, has been illustrated which exhibits the common rolled triangle motif (in this case on the interior, exterior, and rim) and is encrusted with the usual white paint (see fig. 48).

Connections on the Dalmatian Coast can be found in the pottery finds associated with the Late Copper Age (LCA) tumulus in southwest Bosnia known as Rubeža. The finds have recently been pointed out by Della Casa and re-illustrated (see Della Casa 1995: 570, and 1996: 130). The similarities are readily apparent, not only with the "Adriatic type" pottery, but also the Vučedol materials. Della Casa has also discussed the loose finds from the Velika Gruda Eneolithic and Bronze Age burial mound burial in the Boka Kotorska of Montenegro.

The Swiss excavations on Velika Gruda also focused on sampling the stray finds found at various levels within the actual burial mound itself. Analysis of the soils associated with these loose finds (within the tumulus) indicate that nearby earth, which contained the previous occupational debris, was used as filler on the mound. The pottery finds would then be seen to pre-date the burials onto which they were deposited. In this instance, LCA materials of both the "Cetina group" and the "Adriatic type" were found covering and surrounding the LBA graves (see Della Casa 1995: 567-569. While much of the pottery definitely has a connection with the Cetina assemblage, many diagnostic sherds of the "Adriatic type" associate directly with the Eneolithic assemblage from Korčula's Vela spilja and the small finds from Jakasova spilja (KZ-013). As mentioned

[57] See Novak (1954), levels 51 cm.-100 cm.; Čečuk (1986: 47) and Čečuk and Radić (1995: 38) for related finds from Vela spilja; and Novak (1955: 324, and plates T. CCXXXI-CCXXXIII), for some of the Adriatic type Eneolithic finds from the island of Hvar.

briefly above, comparable examples of the "Adriatic type" from Jakasova can be found in Grapčeva spilja assemblage on Hvar (Novak 1955: 323-324).

Outside of the cave contexts (Vela spilja and Jakasova spilja), the Eneolithic occupations on Korčula are not well represented. Figure 53 indicates the rather poor showing (only 3 confirmed sites) for the Copper Age evidence on the island. The other location, situated on the islet of Badija-Lokva site (KK-005), has associations to local assemblages that probably date to the Copper Age.

Other finds from the survey might help bridge the Late Neolithic to Bronze Age gap in the archaeological record. The complex prehistoric hilltop structure known as Maslinovik (KV-022 and see fig. 75), discovered during the Summer 1995 season, has yielded some possible clues. The artifact scatter on and near the hilltop is quite extensive. Lithic artifacts such as a polished stone mortar (fig. 52; possibly granite), polished granite fragments[58] , and a smoothed limestone pestle (fig. 52) have been recovered from the surface scatter and definitely indicate the processing of agricultural products on-site.

Most of the pottery consists of the standard course and generally undiagnostic type found throughout the Dalmatian islands. However, some fragments, such as thin fine ware rim sherds, brown polished fine ware body sherds, and some fine ware handles, compare to some of the LCA-EBA grave finds associated with Velika Gruda[59] and are quite similar to some Late Neolithic Hvar Culture plain wares and Nakovanj Culture polished brown channeled ware fragments. Plans have been made to investigate not only the sub-surface aspects of the Maslinovik hilltop structure but also the small field located due west, ca. 100 meters in altitude lower than the hilltop.

Numerous reasons can be given for this, although none seem to be explored well in the regional literature. The issue should not be clouded by the presence of copper finds on Bronze or Iron Age sites. Likewise, the extremely hazy but nevertheless identifiable presence of copper from the Late Neolithic onwards and both copper and bronze artifacts prevalent throughout the Iron Age, will be taken up elsewhere.

Most of the pottery from the Eneolithic of Dalmatia, either from the Nakovanj group, the Cetina group, or the Adriatic type, is diagnostic enough. That is to say, a channeled and polished dark brown Nakovanj sherd is easily distinguished from a stamped and encrusted Adriatic sherd or an incised Cetina sherd. However, this does not take into account the many course and undecorated (hence undiagnostic) sherds that usually outnumber the decorated ones.

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[58] Note: granite is not native to Korčula.

[59] The materials from Velika Gruda were examined by the author at the University of Zürich, *Ur- und Frühgeschichte*, with the permission of Dr. Margarita Primas and Dr. Philippe Della Casa.

Furthermore, outside of the burial or cave contexts, there do not seem to be many of the diagnostic sherds found in both hilltop and lowland situations. A few open-air sites are known, such as the Buković-Lastvine site along the central Dalmatian Coast, where surface scatter sherds were indicative of an Eneolithic occupation (see Batović and Chapman 1986: 52-53 and Chapman et al. 1990). However, in the case of Buković, the area had been extensively plowed and localized soil deposition trends seem to support a situation in which the finds would be both preserved and near the soil surface.

The latter fact, which indicates the ability at least for artifact discovery, is at the core of the overall debate regarding the Late Neolithic to Bronze Age time frame. There are no solid published materials that discuss the presence of lowland Eneolithic occupational evidence (apart from isolate finds) from any of the Dalmatian islands. Furthermore, the general absence of sites in the lowlands carries over into the Bronze and Iron Age.

The first factor that might help explain this phenomenon is the heavy inundation of the polje and lowland areas with anthropogenically motivated soils. This process, as discussed in Chapter 3, probably peaked in later Roman times, but on Korčula, surely picked up again during the extensive Venetian use of the island's landscape. The lowland settlements, if present, would tend to be concealed by the soils that have washed down during and after these activities.

Another point regarding the absence of lowland settlement evidence can be seen in a broader sense. This involves the actual nature of the palaeoeconomies, settlement patterns, subsistence strategies, cultural connections, and social hierarchies, of the Eneolithic. Philippe Della Casa (pers. com.) has indicated to the author the long-standing problem associated with the Boka Kotorska and the extensive Mala Gruda and Velika Gruda burial mounds. Although these two sites are situated in the lowlands in what appears to be an ideal setting for Copper and Bronze Age settlements, there is no evidence of the settlement (s) that would have consecutively used the two burial mounds. This situation is highly suspect, specifically since hilltop structures (either settlements or alternate functions) are found throughout the general area which date to the same period as the finds from the burial mounds. The question still remains: what was happening in the lowlands during these times?

Chapter Nine

The Bronze and Iron Age on Korčula

9.0 The Bronze and Iron Age Evidence on Korčula Assessed for this Research

The problems discussed in Sections 6.8 and 6.9 pertaining to the Bronze and Iron Age of the Dalmatian Coast are fully applicable to Korčula. Like the Eneolithic, the problems stem from the abundance of undiagnostic coarse ware pottery, which are associated primarily with the prehistoric hilltop structures, or the few limestone cairns on the island which have been excavated or destroyed. However, in light of the abundance of these sherds, a sizable amount of data was nevertheless collected during this research. Numerous trends in the archaeological record regarding these periods have emerged which seem to recur across the island. The preliminary results and conclusions shed some new insight into the nature of the Bronze and Iron Age occupations on the East Adriatic.

9.1 The Prehistoric Hilltop Structures on Korčula: General Overview

Sections 7.4.1-7.4.4 have outlined the typologies which have been employed specifically for this research, concerning the prehistoric hilltop structure evidence. The sites that are mentioned should be consulted in the accompanying appendices (Vol. II, appendix b), for further data not indicated in this text. Many of the attributes not discussed in the text are nevertheless important, such as whether or not the site or related aspects have been published, where the collected or excavated materials are stored, or whether the site in danger of any environmental impact. Therefore, the pertinent sites mentioned in the discussion should be looked up in the accompanying volume in order to verify the overall geologic, environmental, and archaeologic setting at each site.

Prior to this research, no more that 6 hilltops which contained prehistoric remains had been discussed in the literature (see Gjivoje 1969: 40-41). The survey conducted by the author and the KARG is the first attempt to properly document not only the known sites, but to systematically survey across the island's landscape in search of similar hilltop sites. Site plans were made in most instances, but in a few cases, either the extensive vegetation or the topography hindered reasonably accurate plans of the site to be made. In these cases, one or two days clearing brush would permit a more accurate view of the site and associated features, but due to time and logistical limitations, this was not always possible.

The data collected from the survey reveals that there are at least 37 prehistoric hilltop structures now known on Korčula. Of these, 20 have been recorded as complex hilltop structures, 17 have been documented as simple hilltop structures (see fig. 55). The reader will recall that the complex hilltop structures all have evidence of a dry-stone limestone rampart or a "terrace rampart". These can be found to completely encompass the site or extend and partially encompass the site. Figures 72 through 87 illustrate a few of the complex structures that have been documented during this research. The simple prehistoric hilltop structures appear either as non-ramparted drystone enclosures or *kula* (see figs. 72-73) or limestone cairns (see fig. 74). A few of these show evidence of a basal structure comprised of larger flat limestones, mostly sub-rectangular in shape, and in a few instances these stones appear to be upright.

The simple hilltop drystone enclosure has also been referred to as a *kula* during this research[60]. This does not necessarily imply the definitive function of the structure, although many might be interpreted as prehistoric towers or observation points. Some of the actual structures, when visited, appeared to have a physical profile which looked similar to a tower and hence the name. Two have been identified in the simple prehistoric hilltop structure category, while one is found as a feature on the complex hilltop structure KC-002. Likewise, one lowland type has been found (KB-002), although this could be a destroyed tumulus that has been converted completely into a military bunker.

The archaeological evidence at the latter site (small sea cobbles and pebbles, and one fragment of prehistoric pottery), indicate that there was a prehistoric association to the structure. The military intrusion is speculation, purely to offer another scenario regarding the possible origins of the *kula*. In any case, there are no old cartridges, tin cans, or unidentifiable metal debris, which often indicate a former military presence.

A recently excavated hilltop limestone cairn in the Slovenian karst[61] has revealed an underlying structure consisting of a *kula* type structure. Breccia and tumble had filled the structure and distorted the archaeological situation. The site, known as Ostri vrh, is situated on the southwest Slovenian karst near the village of Štanjel (ca. 20 km. north of Sežana, near the Italian border). Radiocarbon dates indicate 7th to 6th century BC (uncal.) temporal connections to the site. Although this site is well north of Korčula, the structural similarities cannot be overlooked. It is not clear if the

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[60] One complex hilltop structure detected during the survey (KB-020) is actually situated on a hilltop with the toponym "Kula". Most of this site is not well preserved, but the viewshed is very good. There is evidence of smaller circular structures within the confines of the outer terrace rampart. However, the site is well exposed and minimal cultural materials were observed on the surface.

[61] The site was excavated in 1992 by Peter Turk and Biba Teržan (University of Ljubljana, Department of Archaeology). Photos of the site during the excavations have been given to the author and permission has been granted by Dr. Turk to discuss the finding here. The actual radiocarbon dates and associated lab numbers have not been supplied.

four preserved *kula* identified on Korčula have a similar function as the Slovenian model, but in any case, the typologies appear to be related.

Figure 54 displays the general data concerning the various levels of prehistoric hilltop site preservation. Clearly, the figures tend to fluctuate between the slightly damaged category (n=17), and badly damaged (n=18). A very poor representation is apparent for those sites which could be classified as well preserved (n=1). It is important to note that the majority of prehistoric hilltop sites are fairly remote. Except for the local landowners, or the geodetic survey crews, few people actually visit the hilltops or even know the footpaths through the heavy *makija* to ascend the various slopes. A small number of the sites, such as KP-005 or KL-004, are very remote and require at least a few hours to pick through the brush to reach the site.

On the basis of the data collected during the survey, it is possible to conclude that in recent times the damage or destruction has probably occurred from either military bunkering, geodetic survey crews working on the hilltop, or farmers using the site for various reasons. In the case of the bunkering and the survey crews, it is usually possible to sort out the recent modifications to the sites. The geodetic crews tend to rearrange some of the stones on the structures into an "X" shape for the ground truths on aerial photo missions (also known as benchmarks). These "Xs" are always painted-over with white paint. It should be noted that most, if not all, bunkering appears to be from partisan activity during Second World War.

As a final note concerning the preservation of sites, it has been difficult to gauge or assess the amount of looting that has occurred to these sites. Many, specifically the simple hilltop structures, show minor evidence of disturbance to the surface of the site. In most cases, it is clear that this is not bunkering (too shallow). The only other causes that can be attributed to the damage (besides bunkering and other military activities), would be local farmers using the materials for nearby requirements, looting, or natural destructive forces. Concerning the latter point, an earthquake during July 1996, centered under the town of Ston on the Pelješac Peninsula, caused a sizable amount of damage to the local area. The quake was not large (ca. 4.5: Richter Scale), but was nevertheless felt on the opposite end of Korčula. The local geologic maps reveal that this part of the coast contains a fair amount of faulting. Therefore, earthquake activity cannot be ruled out as a natural cause of stone rampart destruction over the course of the last 4 millennia.

9.2 The Prehistoric Hilltop Structures on Korčula: Raw Data from the Survey

The prehistoric hilltop structures on the Central Dalmatian islands have seen a fair amount of examination in the past few years. The larger central islands of Brač

(Čače et a. 1995), Vis (Forenbaher et al. 1994), and Hvar (cf. Gaffney and Stančić 1991; Gaffney et al. 1995) have received the bulk of the investigation, although recent excavations have also been conducted on the island of Vis at the Talež hillfort (see Forenbaher et al. 1994: 44-45 for preliminary details). Studies specifically accounting for the prehistoric hilltop structures of Dalmatian islands and their place in the archaeological landscape were not unknown prior to the aforementioned research. Vujnović's field work and examinations, focused primarily on the eastern side of the island of Hvar, took into account the *gradine,* associated tumuli, and put them into a greater geographic context (1990: 47-64).

Mainly due to time and financial limitations, the survey work on Korčula was not supported by a GIS package. Although there are already plans to establish a GIS for the island, the data collection and processing for this thesis had to occur without use of such a system. Therefore, the raw data will have a few analytical deficiencies that are apparent. In Section 7.8.3, the concept of a "human based" GIS was detailed. Naturally, this was not an attempt to replace a proper GIS, but rather it was used as a systematic attempt to establish the geographic parameters in which these prehistoric hilltop structures exist. This was implemented from the outset of the research.

To briefly summarize the technique employed, as each hilltop site was surveyed, a detailed scan was made across the landscape with the use of the "naked eye" and binoculars. Essentially, this is a primitive form of viewshed analysis. Known prehistoric hilltop sites were identified in the viewshed. As mentioned earlier, since only a handful of sites were known prior to this research, "suspicious" hilltops[62] were noted on the topographic maps for potential survey. Naturally, vegetation factored into the equation, because numerous hilltops are thickly covered in pines and makija. These were also surveyed, regardless of how foreboding or remote they appeared, to factor out any bias towards hilltops with the easiest access and least vegetation.

Figure 71 shows the simple and prehistoric hilltop structures on the topographic landscape of Korčula. Viewshed information from the survey has been filtered through the database and is presented in figure 55. Although the entire hilltop site record is not necessarily large (37 sites), very distinct patterns have emerged that can imply cultural and social implications. These implications will be discussed later.

A glance at the viewshed breakdown from the Bronze and Iron Age hilltop structure data reveals many trends in inter-site visibility. There is an obvious tendency for the complex structures (i.e. those which could possibly facilitate extended periods of habitation or other uses), to be situated in positions where 5 or more other hilltop

[62] These suspicious hilltop are simply identified as either prominent features on the landscape, rock outcrops on hilltops, or terracing which appeared near the peaks.

structures can be directly seen (n=11). Likewise, there is an overall polarization of the complex structures to be situated on positions where at least 3 or more other hilltop sites are in the viewshed (n=16). Only 4 sites were found to have 1 to 2 sites in the viewshed.

The simple hilltop structures have a more even distribution in the viewshed projections. Essentially, there does not appear to be a tendency for these sites to gravitate towards a specific aspect of inter-site visibility. Nevertheless, it is important to note that, across the island, these sites always have a visibility connection to other hilltop sites. The fact that this occurs in 100% of the cases is a substantial piece of evidence that will not be overlooked in the later discussion.

9.3 Specific Geographic Variables and Prehistoric Hilltop Structures

Other geographic aspects of these sites should also be noted (see fig. 56). It should be kept in mind that further specific data collection (e.g. ^{14} C, GIS analysis, controlled excavations) will be required in most instances to verify the real *versus* perceived importance of certain environmental or geographic parameters and their connections with the archaeological record.

The database reveals that 85% of the complex hilltop structures have a direct viewshed to bays and the sea immediately adjacent to the site. Six of the complex hilltop structures are located near either fresh water springs or seasonal freshwater *lokve.* In comparison, only 3 simple structures can be found in the immediate proximity of a fresh water source. None of the complex structures have any evidence of limestone quarrying in the immediate area, although in the case of KP-001 and KP-007, the limestone quarry is less than 0.5 of an hour walk away. Three simple hilltop structures are directly adjacent to limestone quarrying (ca. 100 m or less in distance).

The pedologic factors relating the proximity of prehistoric hilltop structures to good soils, specifically the *terra rossas* and Quaternary sands in prehistoric times, are not well founded. The overall lack of understanding throughout Dalmatia regarding the relationship between soils and the archaeologic record has been noted elsewhere (Chapman et al. 1987: 123). Therefore, field recording of the current location of soils on the island and analysis of their possible relationships to the prehistoric landscape can be extremely misleading. Soils that are found within a site's catchment area will be discussed. However, without significant data on either the use of lowland soils in prehistory or even the general pedologic landscapes of prehistory, relating the sites to soils will remain problematic.

Basic parameters were established to allow a general insight into the possible relationship between the prehistoric hilltop sites and the soils *immediately* (author's emphasis) surrounding the site (i.e. those within a ca. 100-150 m. radius). Soils down in

the valleys below the sites were not considered in this case, but are considered in the site catchment analysis in Section 9.5. Although the area of the so-called adjacent soils varied in size, only those patches which were visibly at least ca. 150 m. x 150 m. in size and had not had extensive geological clearance (e.g. JCB removal of geological features), were taken into account. These areas can be referred to as the "immediate catchment" of a particular site. Only 3 complex hilltop structures (15%) were found to have *terra rossa* or other good soils in the immediate catchment of the site. However, in the case of the simple hilltop structures, 9 structures (53%) were located in an immediate catchment with good soils. This figure seems quite significant in the overall data set of the prehistoric hilltop structures.

Land communication routes and their proximity to the prehistoric hilltop sites were also examined. This type of study tends to be highly speculative, given the very limited data available concerning prehistoric roads in Dalmatia, although a general analysis of prehistoric and ancient roads in specific areas of the coast has recently been offered (Zaninović 1995: 34-36). Reconstructing prehistoric roads and communication routes based on the overall archaeological record of a micro-region has been conducted elsewhere with fairly good results (e.g. Bakker 1976)[63]. In any case, it would seem logical that on an island with pronounced geographic features, such as high mountains, narrow valleys and few expansive *polje*, only a few routes over the island's terrain would have been possible. The routes mentioned here are those which are considered to offer the least geographic resistance, or in cultural terms, support the "principle of least effort" (Zipf 1949).

For example, the only way to physically pass from the western side of the island to the central part (from the Blatsko polje to the Čarsko polje) is either through the narrow valley pass at Mala kapja or the Donji lov valley, due south of Kom (see fig. 3). Geographically, these are the only realistic routes between these two sections of the island, excluding extreme methods such as scaling cliffs or footpaths up and down extremely steep hilltops. The Mala kapja pass is the route of the current two lane tarmac highway across the island, while the route through the Donji lov, often referred to as the *stari put* (old road) from the village of Blato to Smokvica, is mostly unpaved. The presence of numerous prehistoric hilltop structures above these routes should not seem a coincidence. Likewise, it should be pointed out that the alternate tarmac route across the southern shore of Korčula, from Pupnat to Čara and from Brna Bay to Gršćica, had to be cut into the limestone in many places. This latter feat was not begun until the much later Austro-Hungarian times.

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[63] Bakker's study is focused on the *Trichterbecherkultur* (TRB) Neolithic culture; in this instance, the northwest TRB evidence.

Therefore, it is possible to attempt a broad reconstruction of the communication routes across the island. The scant evidence of the Roman road system and the few "old roads" across the island allow the basis for the general picture to be formed (see fig. 88). Clearly, this projection can be confronted by numerous objections, the foremost of which would concern the lack of evidence supporting specifically "ancient or prehistoric" roads *versus* a more recent "older road". However, given the aforementioned geographic factors which logistically limit communication routes across the island to only one or two logical possibilities, this issue can be somewhat mitigated for the purposes of this study.

The situation east of Pupnat requires some description. Figure 89 illustrates the major monumental sites with the area near the village of Pupnat. In this case, the villagers still call the dirt track the *stari put*. An aerial photo (AP) of the area reveals the extent of the preserved track, its association to the landscape, and the position of the new tarmac road (see plate 2). An enlarged photo of a section of the landscape on the AP (plate 4) reveals the presence of two large cairns (KZ-002, KZ-015) directly adjacent to the intersection of two old roads. This has been illustrated in figure 88. If the contemporaneity of these structures and the track can be suggested, then there are definite functional aspects that can be applied to these cairns and numerous cultural implications.

Finally, a few anecdotes concerning the amount of time it takes to cover certain distances on the island's old (unpaved) roads can be given. An older man from the village of Čara has explained to Prof. Radić that he could cover the distance from Čara to the seaside village of Račišće in just under 2 hours, walking on the old dirt track. The old man had reason to be deliberate in his walk to Račišće because, as he claimed, he had a mistress who lived in that small fishing village. So, it can be generally accepted that the distance could be walked at a slow but steady pace in less that 3 hours.

Similarly, a villager from Vela Luka (Dinko Lovričević), stated to the author that it took about one hour to walk from Vela Luka to the village of Blato on the old dirt track roads before the tarmac route was constructed. This is particularly interesting archaeologically because part of this track is directly on the Roman road system that runs from Vela Luka towards Blato (Prof. Dinko Radić pers. com.). Lovričević also pointed out a rather interesting aspect concerning the seabourne communication route. Apparently, the trip from the mouth of the Vela Luka bay to the town of Korčula, in favorable conditions, could be rowed in ca. 8 hours. Given the previously discussed long distance capabilities of the local Dalmatian craft, this does not seem such a difficult journey.

9.4 Limestone Gomile, Tumuli, Cairns and the Issue of Field Clearance Cairns

Section 7.4.4 has detailed the general problems concerning the thousands of limestone cairns or *gomile* found on the landscapes of Dalmatia. Since none have been properly excavated on Korčula, the data concerning the contents of these structures is very scant. It is easy to speculate that there could be more on the island, but only those which were discovered during the survey or known from local knowledge and past literature (and physically verified) were recorded into the database. Since this research was island-wide, this data currently constitutes the known body of evidence concerning the limestone cairns. The limestone cairns have been documented in numerous positions on the landscape, but a differentiation should be made between the standard *gomile* and those that occur exclusively on hilltops, known as the simple prehistoric hilltop structures. The general data set pertaining specifically to all of these structures can be seen in figure 57.

The *gomile* on Korčula are found along the rims of the *polje* (on gradual slopes), down in the *polje* basins (flat areas), in areas which geographically tend to be less extreme (rolling terrain), and occasionally on hilltops. These specific geographic settings found on Korčula are also confirmed on other islands, such as Hvar (Vujnović 1990). Furthermore, as noted on Hvar and elsewhere on the Dalmatian Coast, many of the cairns occur in areas where there is no evidence of past or present agriculture (see Gaffney et al. 1995: 48). Such is the case on Korčula, as evidenced by the five prominent tumuli found along the rim of the Sločajna polje (see fig. 3). These *gomile* and the Sločajna polje are at the base of the KC-002 complex hilltop structure and therefore, it should be safe to assume that these cairns might be associated with the structure above.

Since these structures seem to plague archaeological studies elsewhere in Dalmatia, thorough details were collected from any local informants who had reason to give some insight. Dinko Lovričević (*ex* Vela Luka, age ca. 65) was questioned about the limestone cairns in the agricultural areas near the village of Vela Luka. He claimed that although many of these *gomile* were on the nearby landscape when his family was building terraces for vines (pre-1940), there was no reason to rob the stones from these structures, because the surface breccia in the area always provided an abundant supply. He further stated that it seemed too much of a problem to move the stones from one central location (a cairn), to various spots along the terrace, when stones in the immediate work area could be collected and incorporated much easier.

Lovričević also recalled that during those times, there did not seem to be a desire in many villagers to excavate the cairns simply to displace curiosities about the contents. He said this could have been due to the fact that almost the entire village worked on

terraces from early in the morning to late in the afternoon, except for the noon *fiaka*[64]. The motivation to do extra manual labor, like moving yet more stones, this time from a *gomila,* merely to inspect the contents, did not really appeal to most individuals. Furthermore, information from excavated Bronze and Iron Age *gomile* on the nearby islands and coastal areas[65] indicate that in general, the grave goods tend to be very poorly preserved, and therefore would rarely carry any aesthetic or potential monetary value. Hence, there would be no reason to rob the graves because the contents always seem to be primarily limited to fragments of course ware pottery and a few skeletal remains.

Evidence from the Korčula survey also shows that in some instances, such as KV-020, the *gomila* was incorporated directly into the terrace, as if there was a deliberate attempt build the terrace completely around the cairn. In this case, undiagnostic prehistoric pottery was also found near the center of the partially destroyed cairn, which would tend to support archaeological *versus* agricultural aspects of the structure. The latter scenario does not take into account the problem of general agricultural field clearance. Local farmers might pile debris in one locus to clear farmlands (Chapman and Shiel 1988: 35-36), hence creating a cairn, or throw materials onto a conveniently located prehistoric cairn. It is clear that a cairn would make an ideal place to pile unwanted stones, pottery, and other debris found on the arable lands. In fact, during the early and mid 1980s, some of the survey work on the island of Hvar focused specifically on the clearance debris found on the limestone walls and cairns of the Stari Grad plain (Slapšac 1988: 145-149). It was even noted that in many cases where there was dense vegetation, the stone walls and stone heaps were the only places where surface archaeological material could be expected (op. cit.: 148).

With local island trends noted, such as those above, how could the situation on Korčula be any different? Predrag Novaković (pers. com.), who has worked on both the Dalmatian islands, Slovenian coastal karst areas, and is a KARG member, has commented that the cairns on Korčula tend not look like "stone clearances" which are seen on other islands or the coast. On Korčula, there are only a few instances where it is clear that fieldstones, pottery and debris have been thrown onto the cairns.

The author established some basic parameters with which all cairns could be evaluated. Essentially, these amount to nothing more than an examination of the size and weight ratios of the stones on the cairn. Those few cairns that have been used for clearance contain stones of all sizes, ranging from 3-5 cm. to more than 30-cm. diameter.

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[64] This also corresponds well with the documented economy of the island during the pre-Second World War period, which was based almost exclusively on intensive wine production (see Section 2.5.5).

[65] See Petrić 1979 and Marović 1985 regarding Hvar, Marović 1976 regarding the Cetina river valley, and Petrić 1976 and 1981 regarding the Pelješac Peninsula.

All shapes and sizes appear and there is no uniformity to the pile. Naturally, if the purpose were to simply "clear" these unwanted stones from the agricultural areas, then there would tend to be a lack of consistent size, up to a certain point, in the stones on the heap. This is reflected on these clearance cairns.

However, when the known prehistoric limestone tumuli which are associated with another prehistoric structure, contain burials, or are empty, are examined, the stones all appear to be of a very similar size and weight ratio. In these structures, rarely if ever does a stone fall under the 2-kg. weight or above the 15 kg. weight[66] . This uniformity tends to suggest a more deliberate selection of stones which might easier to lift, easier to transport, and easier to use when constructing a *gomila*. Furthermore, in the few places on Korčula where prehistoric limestone quarries have been positively identified in association with Bronze or Iron Age occupations, there appears to be an abundance of stones under the 1 kg. weight class (unselected debitage), but rarely any above this (the desired fragments which were removed). Perhaps this situation is unique to Korčula and therefore, the clearance cairn *versus* archaeological cairn situation appears less hazy.

The contents of the structures seem to be at the forefront of the "clearance cairn *versus* archaeological cairn" issue in most of the discussions in Dalmatian archaeology. In fact, this is the least known physical characteristic of these structures which has been tested systematically, and therefore, should be the last variable to be used in assessment. Almost all of the *gomile* on Korčula are in the proximity of a complex prehistoric hilltop structure, while many others are near simple hilltop structures. Meanwhile, there are no cairns which appear in archaeologically barren geographic settings on Korčula. Clearly, excavated limestone tumuli known from Hvar were used for more than one grave (see Marović 1985: 14-15), while in the Boka Kotorska on the southern Dalmatian Coast, single tumuli were used for dozens of Copper through Iron Age graves (see Della Casa 1995 and 1996; and Primas 1992).

It is completely within the realm of possibilities that many structures were constructed or prepared during the Bronze and Iron Ages, but never used for whatever reasons. Whether or not these structures contain burials is not the real issue. The crux of the cairn debate should focus on whether or not these were constructed in prehistoric and protohistoric times, or alternatively, during the more recent land clearances. This position contrasts drastically with that taken by the Neothermal Dalmatia Project (NDP), in which cairns were interpreted primarily as field clearances, and only secondarily as burial *or prehistoric related* (author's emphasis) limestone cairns (Chapman et al. 1987: 128-129; Chapman and Shiel 1988: 11). Likewise, the NDP

pointed out that in the main study area, located near Zadar and ca. 150 kms north of Korčula, clearances were still being created up to the present day (Chapman and Shiel 1988: 11). In contrast, there is no evidence on Korčula which indicates that modern farmers make or have made clearance cairns.

A few final points should be mentioned which could further clarify the clearance cairn *versus* archaeological cairn issue on Korčula. Geographic records from Medieval and Early Venetian (ca. 1215) periods detailed in the Korčulanski Statut (see Section 5.1), name places such as *terram Gomila* near Vela Luka (Hanel 1877: 131). Clearly, some of these structures must have been as prominent on the landscape then, as they are now. These same *gomile* remain on that mentioned location, and it is interesting to note that it was only after the Venetian period that the entire area was terraced for vineyards. Therefore, these cairns not only pre-date the terracing for vines, but also survived the terracing efforts, and were not noticeably depleted or destroyed.

Finally, Korčula's massive wine-based economy prior to the Second World War needs further discussion. During the survey, the author noted that almost the entire island has evidence of terracing of some kind. The main areas which do not have terraces or field walls are located in the central and rugged highlands, between the villages of Čara and Pupnat, and along sections of the southern fringes of the island, where cliffs prevail. The author estimates that at least 75% of the island has been terraced. Coupled with the historical records specific to Korčula, which indicate a primary economic reliance on wine until the 1940s, there is good reason to believe that most of the island's surface breccia at one time or another has been incorporated into terraces for the vines. Hence, field clearance was more often than not directly transmitted into the terrace construction, and not piled in useless heaps on the landscape.

9.4.1 Data Concerning the Limestone Cairns and Gomile

A total of 76 limestone *gomile* have been documented during this research. Only 4 tumuli have clear grave evidence that indicates use in funerary activities. As mentioned before, no cairns on the island have been properly excavated. However, it is interesting to note that all of the cairns which had to be involuntarily destroyed, either due to road construction (KB-019 or KS-015) or fire break clearances (KL-011) revealed burial constructions (slab cysts) and human remains. Fragments of a probable grave offering (see fig. 48) have been found during this thesis research at a disturbed cairn near the Lokvica "kula" site (KZ-006). The find corresponds well to known Bronze Age

[66] 10 cm. to 30 cm. diameter, based on a semi-round shape.

grave offerings which have been documented on the island of Hvar in the cairn fields of Bogomolja, Gdinj, and Vira (cf. Marović 1985 12, 20-21, 25).

At least 21 of the documented cairns had undiagnostic prehistoric pottery associated with the structure. Often, the fragments were intermixed with the stones of the *gomila* and occasionally, on the badly disturbed cairns, pottery was found among the rubble in the impacted areas. Dr. Philippe Della Casa (pers. com.) has indicated that some of the external pottery found on the cairns might be due to unsuccessful attempts by looters to extract the poorly preserved grave goods. This would make sense given the nature of Dalmatian *gomila* grave goods.

A rather peculiar data set has been collected regarding the presence of small sea cobbles of 0.5 cm. to 3 cm. size (and a few small seashells and gravel), that have been found at 4 separate sites during this research. Two of the finds are from semi-destroyed cairns, while the other two find spots are derived from sub-surface materials at the Kopila complex hilltop structure (KB-017) and the simple hilltop structure of Sutvara (KS-007).

Finds of this type were also noted with some tumuli contexts on the island of Hvar (Gaffney 1992; Gaffney et al. 1995: 49). Nothing conclusive can be stated concerning these finds due to the limited nature of the data. However, one option within the realm of possibilities is that these are a grave offering of some kind, reflecting cultural associations to a marine resource. Since they have also been found in non-grave contexts on Korčula (KB-017 and KS-007), perhaps they reflect a byproduct of a specific maritime resource exploitation. The rounded sea cobbles, gravel, and small seashells would indicate near shore resource procurement, possibly where light bottom dredging would be needed to collect shellfish. Hence, the shellfish, rounded cobbles, and other materials would be collected at the same time.

Eight of the cairns have basal structural features of some kind. Specifically, these features are usually comprised of flat limestones that have been arranged to support or delineate the foundation of the cairn. Due to the nature of the tumble on many of Korčula's *gomile*, basal structures may tend to be obscured. Therefore, other cairns on Korčula might reveal these structural features once the tumble has been cleared.

9.5 Problems of Contemporaneity: Bronze and Iron Age Hilltop Structures

A loose or general contemporaneity among archaeological sites (more often than not based solely on the presence of similar pottery, structure types, etc.), has often been assigned to specific physical landscapes to facilitate spatial analysis studies (e.g. Hodder and Orton 1976: 18). However, liberal application of archaeological contemporaneity on

the Dalmatian landscapes, specifically regarding studies such as spatial distributions and settlement patterns, can be completely erroneous. Basically, the current understanding of Dalmatian island chronologies, specifically from the Copper Age and Early Bronze Age through to the Late Iron Age, is not well sorted in the literature. There are no local radiocarbon dates and no detailed typological analysis, specifically on structures and pottery found outside grave contexts, which can currently alleviate this situation. Therefore, except for rare instances, surface finds alone are difficult to use as specific indicators of contemporaneity regarding these archaeological periods. One section of the western end of Korčula can be used to illustrate this problem (see figs. 3 and 71)

As previously stated, the Maslinovik complex hilltop site (KV-022) has associations, at least regarding the pottery, which tend to lean towards the Late Copper Age and Early Bronze Age. Meanwhile, the Gradac complex hilltop site ca. 2.5 kms to the southwest (KB-003) has pottery that might more generally be called Later Bronze Age, although as a whole the materials are highly undiagnostic. To further complicate the issue at Gradac, the only solid materials from the area which can be dated with reasonable certainty are from the Iron Age and consist of Illyrian and Greek pottery and vessels (Radić and V. Vukasović 1887: 110) and three Roman *villa rustica* (Radić 1989) found exclusively in the polje below Gradac.

Just over 2 kms southeast of Maslinovik is the complex hilltop structure known as Kula (KB-020). At this site, only 3 very badly preserved pottery fragments were found, of the usual rough undiagnostic coarse ware. Just over 1 km east of Maslinovik on the southern fringes of the Blatsko polje are the simple hilltop sites of KB-015 and KB-016. The KB-015 has a very larger cyst grave that has been looted and is now exposed, while the nearby KB-016 has evidence of a prepared limestone structural foundation. However, the pottery from these sites is also undiagnostic. Finally, at just over 2.5 kms to the northwest of Maslinovik is the complex hilltop site known as Kopila (KB-017). Artifacts from this site, both from the surface and from one small sounding, are mixed in the same context with Iron Age Illyrian ceramic materials and Hellenistic Greek fine ware fragments.

If the western end of Korčula is then looked upon as a small case study and the hilltop sites within a radius of under 3 kms from Maslinovik are seen as the core evidence, the vast disparity among the contemporaneity of the sites barely allows a valid study. The only two periods which seem to have a links across this landscape are the later Illyrian and Greek periods, and even these could not be compared at a resolution which could reasonably focus on settlements or settlement patterns. This very vague temporal situation prevails across the entire island. Therefore, numerous solutions were

examined to alleviate the contemporaneity problem (outside of the excavation and ^{14}C sampling channels-both well out of the scope of this thesis research).

A very realistic approach to slot a number of sites into a general chronologic framework has been devised by Dewar (1991: 604-620). Basically there is a tendency in many studies, specifically those based on static maps, to indicate more occupations than were ever simultaneously occupied in a specific geographic region and results in the "overfilling" of site distributions within a certain area (Ammerman 1981: 63-88). This can lead to errors such as "double counting" sites contained in the database of a certain region. Dewar related the problem of contemporaneity down to two variables, the frequency of population relocation and the length of the phases. The mathematical solution presented, as a mean occupational span, is based on counts of sites occupied at the beginning and end of a given period and, through simulation, an estimate of the number simultaneously occupied sites is derived.

The application of this method seems to give fairly decent results. However, the main drawback regarding the inability to account for sites that were both established and abandoned within the period (s) in question was apparent. This led to a reworking of the original Dewar model (Kintigh 1994: 143-148) which set off a productive and somewhat conclusive debate over the use of both the original Dewar model and the Kintigh variant (Dewar 1994: 149-152).

However, a solution to the contemporaneity problems of Korčula could not completely be solved by this system. The problems stem from the basic data needed to reasonably get results from the model. Even a few isotopic dates associated with pottery would help the situation, but as of yet, none have been conducted on the Bronze and Iron Age hilltop settlements on the central Dalmatian islands of the immediate coast. In order to run the model properly, this general information must be either known or good estimates projected concerning the sites. The original Dewar model (1991: 608 or Kintigh 1994: 144) has been illustrated to show the general outline and workings of the system (see fig. 62), although for this discussion, the equations have been left out. The phases can be recognized as X, Y, and Z (for the Korčula problem, the Copper Age (X), Bronze Age (Y), Iron Age (Z) *or* Bronze Age (X), Iron Age (Y), and Illyrian/ Greek (Z).

The problems concerning the Korčula model can now be somewhat explained. Alternate phases could be arranged, such as Copper/ Bronze Age (X), Iron Age (Y), Greek (Z) and plugged into the mathematical model. However, this tends to be quite biased, since only two hilltop structures showed evidence of Greek wares, and one of those sites (KS-010) consisted of only one sherd. Likewise, unlike Hvar or Vis, Korčula still does not have a confirmed Greek occupation. Hence, these wares might be contemporaneous

with what would archaeologically be diagnosed as an Iron Age occupation (Illyrian), hence the final phase of the model (Greek-Z), does not hold up.

It is obvious that in order to tackle the problem of contemporaneity correctly, sub-surface sampling into the *in situ* cultural horizons must be conducted. This must be done not only in a systematic and island-wide manner to sort out the extremely uncertain pottery issue, but also with the intent of collecting materials for radiocarbon dating vitally needed to support these pottery finds. Until this is done on Korčula, certain spatial analysis such as Thiessen polygons, on a localized level, will amount to nothing more than misleading temporal guesswork.

9.6 Spatial Distributions, Site Catchments, and Settlement Patterns

The summarizing statements in the preceding section would tend to exclude the use of the Thiessen polygon for prehistoric hilltop structure analysis. Given the current state of the temporal archaeological procession, a rather false picture would definitely be projected using this analytical tool on a localized level. However, this should not exclude its use over a much broader scale. At a much lower resolution, use of a Thiessen polygon-based landscape study reveals a rather interesting archaeological picture which carries potential for discussions centered on the cultural and social aspects of Dalmatian prehistory. It should be kept in mind that the sea itself can be viewed as a natural marker that delineates certain geographic regions (islands), and perhaps cultural territories.

Figure 61 shows an application of the Thiessen polygon technique based on a number of factors specific to Korčula. It should be kept in mind that while the projection of Korčula, seen in figure 61, is probably not a contemporaneous island-wide settlement pattern, elements within could be contemporaneous, and it is this point which will serve as the basis of this discussion.

The zones have been defined based on geographically limiting natural features. These can be seen as steep mountains with only narrow passes which connect to the next geographic zone (zones II to III and III to IV interface) or the abutment of a *polje* to a steeper or varied terrain landscape (zones I to II and IV to V interface). The Thiessen polygons applied are based on only one hilltop site in each zone that has the best evidence of contemporaneity to sites in other zones. In this model, the delineation of each zone is centered on a geographical based catchment versus a cultural or site based catchment. Once the Thiessen polygons are in place, based on a central hilltop site within each respective zone, it is clear that the polygon lines almost parallel the geographic zone delineation. Therefore, each geographic zone can be seen as possessing its own unique or individual archaeological evidence.

In the Korčula example, each Thiessen catchment area contains not only its own geographically defined boundary, but also other important natural elements as well. All zones, except for zone V, have evidence for fresh water springs or seasonal ponds. Naturally, the drawback is that this data is based on the present (1997) freshwater evidence. Areas in zone V, such as the Donje blato or Gornje blato, currently with poor saline saturated soils, were probably active in other times. This is based not only on a 13th century reference in the Korčulanski Statut to crops and lands in those areas (see Hanel 1877: 136), but also on the toponym "blato" itself, which implies a muddy area, or an area with some sort of fresh water upwelling or a basic geologic tendency for surface water retention. Therefore, there is clear evidence that each zone might have had its own fresh water source in prehistory.

Likewise, the soils within a catchment area are equally as important. As mentioned earlier, the data concerning prehistoric uses of the soils and fields is sketchy at best. It can be assumed that the lowland areas must have been used during these times, either for agriculture, grazing lands for animals, or both. Other studies on the Dalmatian islands have examined soils within individual site catchments using a GIS (Forenbaher et al. 1994: 34-35; Gaffney and Stančič 1991). In this regard, there is almost no major difference between those soil catchment relationship to the hilltop sites on Hvar, and those found in the this research. Basically, the Thiessen polygon study projected on the island of Hvar (Gaffney et al. 1995: 46), has produced an end product which is still very similar to that of the Korčula model. Naturally, the GIS was able to scrutinize the data much better in the Hvar case.

In some cases, where bordering areas of the Thiessen polygons are present, simple prehistoric hilltop structures seem to be present. This can be seen in the case of the zone II to zone III transition. The evidence at Marča vrh (KS-015) is situated on a geographic high point overlooking not only the central section of the island, but also one of two passes which lead to that region. In the same area, there is also a complex hilltop structure (KS-001/ Gradac) which is suspiciously positioned on a promontory at the entrance to the same aforementioned narrow pass which leads to the central mountains, rolling hills and *polje*. At the zone III to IV transition area, the same scenario appears to be in place. To enter into the main fields and lowland rolling hills in the area defined as zone IV, it is necessary to either pass by a simple or complex hilltop structure, depending on the route selected.

These observations definitely have environmentally deterministic overtones. Preliminarily, it can be suggested that these areas, isolated by the Thiessen polygons, indicate catchments that might equate to community areas, or "community catchments" as opposed to "site catchments". It is conceivable that within each community area,

numerous hilltops (and the lowlands), were used randomly throughout any given period. Across the island, this could be the case for each community catchment. Therefore, from community to community, there would be a general level of contemporaneity. But, within those individual areas, many sites might be used periodically, others only sporadically, and this would suggest a slightly different social arrangement. Instead of the focus on "one hilltop-one catchment-one community area", this research would project a scenario of "many hilltops-one catchment-one community area". This would imply a less strict cultural grouping, perhaps based around extended families, which would have been centered in semi-geographically defined, and socially prescribed, community areas.

Obviously, a GIS with use of a Digital Elevation Model (DEM) will assist greatly in clarifying the situation, not only with analysis but general illustration. The ancient and old road evidence generally couples with the grouping of the island into geographic zones. The paths or tracks are in close association to many of the prehistoric hilltop sites, as well as seaside ports and field systems within the individual catchment areas. Use of a GIS would enable the different layers of evidence such as roads, soils, topographic features, and the archaeologic record to be scrutinized in a much more thorough manner.

Evidence of either cairn or slab cyst-type[67] burials has been found in all five of the geographically defined zones. Certain areas contain what might be called a "public necropolis", if these cairns were used actually used for burial. The evidence northwest of Vela Luka along the northern edge of the Brdat polje is not entirely clear due to recent landscaping on and near the numerous cairns. However, these cairns were mentioned in the Korčulanski Statut, so at least a pre-Venetian association is certain. Unfortunately, there is only one nearby Bronze or Iron Age hilltop structure, that of Sv. Ivan/ Gradina (KV-006), at ca. 2 kms distance to the south.

The cairn field evidence south of Vela Luka is more defined. At least 12 cairns have been positively identified in and around the Potirna polje at the base of the Gradac complex hilltop structure. Due to the extensive vegetation cover along the southern edges of the field, the survey had to exclude this area which was almost impossible to reconnoiter. However, local farmers have mentioned other limestone cairns in the dense brush, so there is no reason to discount further discovery of these structures. Of particular interest in the Potirna polje is the apparent grouping of the cairns, often detected in clusters of three (see KB-002, and 004-014).

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[67] A few of the burials documented during this research were found in situations where empty stone-slab cysts were visible, but the covering slabs and limestone cover (if any) is no longer present. KC-016 and KB-035 are documented adjacent to Bronze and Iron Age hilltop sites. KC-008 is actually on the prehistoric complex seen in figure 89, adjacent to the southern quarry site.

While the reason for these groupings is still unclear, GIS research on the Vira bay cairnfield on Hvar indicates that all the cairns were in sight of one specific or centralized point (Gaffney and Stančić 1991: 63-64; Gaffney et al. 1995: 44-51). A similar situation appears to be the case with the Potirna polje evidence, with the central structure being Gradac. Likewise, the soils in the Vira area were recognized as rather poor (op. cit.: 63), which tends to suggest a funerary *versus* clearance cairn prehistoric scenario. A glance at the soils map seen in figure 5 shows that while there are some good soils in the Potirna area, there is also an abundance of the poorer type which further suggests a connection to the situation at Vira. As a final point of interest, the Vira and Potirna polje cairn fields are both in a very similar geographic setting which is near the shoreline and numerous protected bays.

The five cairns associated with the Gradina 555 (KC-002) complex hilltop structure require further discussion. It has already been pointed out that the five main cairns are found in a barren locality, regarding good soils. The Puhovo polje could have served as a small grazing or farming area, as it is just below Gradina 555. However, the Sločajna polje has no significant evidence for past or present agricultural use. Aside from the five large cairns, which are all well within the southern viewshed from the site, there is also an exposed slab stone cyst grave (KC-016) just on the edge of the old road leading to the Puhovo polje. The grave might have been a limestone cairn at one point, but due to the natural amount of surface breccia in the area, it is difficult to ascertain this aspect.

The area surrounding the modern village of Pupnat has also revealed interesting evidence concerning prehistoric settlements and settlement patterns. Figure 89 illustrates the main monumental archaeological evidence from the area. Naturally, the problem of contemporaneity poses the biggest hindrance to a static map representation such as the one indicated. However, if the evidence is indicative of a multi-period occupational sequence, then it is clear that a fairly small area has supported quite a bit of prehistoric activity. The main advantage this geographic area has to other parts of the island, are its higher elevation and well-protected nature, due to the surrounding hills and mountaintops. The village of Pupnat itself is situated in the basin below. Essentially, the area appears as type of geographic catchment.

It should be pointed out that before this thesis research began, only the KP-007 site, and very general details of the Močila group were known (see Čečuk and Radić 1995: 46-48). Clearly, as figure 89 illustrates, survey in the area has revealed rather dense Bronze and Iron Age monumental evidence. The recent discovery by the author and various KARG members of two quarries in the area, sheds a bit of light regarding a possible source for materials used in the construction of these structures. Likewise, the

one small grave (KP-008) which has been exposed on a hilltop, directly adjacent to a quarry and a massive hilltop cairn, suggests that many geographic positions might have had multi-faceted cultural importance. The so-called "other prehistoric structures" discovered in the area (see figs. 76-77, plus KP-024) indicate further settlement activities in the area.

The Jubak-Kosirica (KP-007) complex hilltop structure (see fig. 85) contains a large amount of surface pottery. Grab samples were collected for comparative purposes with other sites on the island, but it is clear that the site must have had a rather extensive cultural association. During the summer season of 1995 two KARG members, Prof. Dinko Radić and Asja Zec, set up a small sounding on the northwest limit of the encompassing rampart. The finds were not well stratified, with only a limestone tumble and sub-surface humic soil layer visible. However, the finds from the small unit, mostly from the soil layer, included large mammal (probably cow) and ovicaprid bones. Although the unit was quite limited it is now clear that a sub-surface cultural deposit is evident on the site. Stratified remains can probably be found in many positions on the site that would make this an ideal site for obtaining much needed radiocarbon samples.

To the east of Jubak-Kosirica is the recently discovered Lokvica (fig. KZ-006) and associated cairns of the Zahomje polje (KZ-006-012, 014). The archaeological locality was detected by the KARG during the Summer 1995 season. Follow-up survey in the area by the author revealed the extent of the cairn distribution, and the previously discussed cup fragment (fig. 48) possibly with Bronze Age connections. The structure associated with the cairns is quite small to have been affiliated with habitation. Therefore, unlike the other cairn groups to the west of the island, this cluster lacks a clear complex hilltop structure with which they could be associated. A similar situation in which a cairn cluster had a "missing settlement" was also recognized on Hvar (Gaffney and Stančič 1991: 65; Gaffney et al. 1995: 46-48).

There is a possibility that the stone ramparts connected to the more modern church of Sv. Ilija on the nearby hilltop Veliki hom could have been from a destroyed prehistoric structure. A brief visit during the first season of research (1993), did not reveal any clear signs indicating a prehistoric association. However, due to extensive vegetation on the site, the situation on the ground was not entirely clear. The main areas cleared of makija are near the church. However, a stone rampart encompasses part of the hilltop and although the construction appears to be too tidy for prehistoric works, the possibility cannot be ruled out that there might be Bronze or Iron Age evidence on the position.

The Mindel area on the eastern end of Korčula is referenced in the Korčulanski Statut, although the actual cairns are not mentioned (Hanel 1877: 136). However, the

emergency firebreak, which recently exposed one of the cairns (KL-011), indicates that the tumuli seem to have survived the local agricultural pursuits that include extensive terraces and field walls. These cairns also lack an associated so-called settlement site, although all of the sites are well within the viewshed of the nearby simple hilltop structure of Vela straža (KL-004).

Chapter Ten

The Greek and Roman Evidence from this Research

10.0 The Greek and Roman Evidence

Although the research for this thesis did not specifically focus on many detailed aspects of the "classical" archaeological record, all Greek and Roman finds or related sites were documented. Like the prehistoric periods, the protohistoric record is by no means complete. During future fieldwork on Korčula, it is hoped that more extensive lowland survey can be conducted to give further insight into these phases of Korčula's past.

10.1 General Data Gathered During This Research: Greek Contexts

Figure 58 illustrates some of the more prominent data collected on the survey and processed in the database. At this point it should be noted that there is still no clear evidence for either the Cnidian (early 6th century B.C.) or Issian (3rd century B.C.) colonies on Korčula. The KARG investigations into the Greek evidence on the island have been recently detailed (Radić and Bass in press: a), but some of the main points gathered through the author's investigations will be mentioned here. Kirigin has detailed the problems relating to numerous coins which might have derived from the Cnidian colony on Korčula (1990: 293), but the entire issue is still unsolved.

10.1.1 The Cnidian Colony

This archaeological situation surrounding the presence of a Cnidian colony on Korčula has been discussed in greater detail elsewhere (cf. Beaumont 1936: 173-174, Lisičar 1951: 51-125, Novak 1955: 297-305; Wilkes 1969: 8-9, Rendić-Miočević 1980: 229-250, Boardman 1980: 227, Kirigin 1990: 293, and Wilkes 1992: 113).

As mentioned in Section 2.1, Korčula's name in antiquity was Kerkira Melaina, arising from Korčula's dark pine forest later detailed by Appolonius Rhodius (n. 569)[68] . The Late Archaic Greek colony on the island, supposedly established by the Cnidians (Pseudo-Scymnus 421, Strabo 7.5.5, Pliny: III, 152), was aided by the Corcyrians who owed the Cnidians a favor. Three hundred Corcyrian boys (from Kerkira, or modern Korfu) were rescued by the Cnidians (Samians?) from Periander the Tyrant (see Herodotus iii, 48-49) and hence the debt was honored. The name given to the island, in

[68] See Lisičar (1951) for the most thorough discussion of the Greek connections to Kerkyra Melaina, including the classical references to Korčula and related archaeological finds on the island and in the region.

honor to Kerkira but not to be confused with the namesake, was Kerkira Melaina. Strabo's description of the area and its native peoples tends to serve as the best basis for evidence of the Cnidian colony:

> "And then there is Mount Adrium[69] which cuts the Dalmatian country through the middle into two parts, one facing the sea and the other in the opposite direction. Then come the River Naro[70] and the people who live about it-the Daorizi, the Ardiaei, and the Pleraei. An island called the Black Corcyra[71] and also a city[72] founded by the Cnidians are close to the Pleraei, while Pharos[73] (formerly called Paros, for it was founded by the Parians) is close to the Ardiaei." (7.5.5)[74]

There are at least three possible locations for the site of the Cnidian colony. The first is the modern town of Korčula, the second is the Lumbarda area, and the third is Vela Luka area (Beaumont 1936: 174-175). However, Kirigin has recently pointed out that the location of the Cnidian settlement has not yet been solved and that only thorough island-wide survey will yield new information (1990: 293). It is perhaps this latter statement which has sparked renewed interest in the Cnidian colony issue and has chided the author to conduct investigations into this situation.

Although Beaumont originally pointed out the basic problems that concern each of the possible locations for the colony on Korčula (1936: 174-175), Novak also detailed a very thorough examination of the possibilities (1955: 302-303). Beaumont believed that the town of Korčula would perhaps serve as the best location for a colony site. However, the landscape in this location is entirely covered by the current town of Korčula, and except for a few small locations near the town, none of the topsoils are visible. Novak believed that only two locations were probable for a colony, Korčula Town and Vela Luka, mainly due to the nature of the harbors and proximity to lands which could produce trade-worthy products (1955: 302). Based on experience alone, Novak's views might carry more weight over Beaumont's, since the former researcher not only conducted fieldwork on Korčula but was well acquainted with the geographic nature of the island.

Unfortunately, both Korčula town and Vela Luka are present village locations, which makes sub-surface investigations somewhat difficult. The Lumbarda area (see plate 1 and fig. 3) would appear to have better search prospects for finding either Cnidian or Issian colony sites, since this area is primarily under vineyards and with local farmer permission, resistivity or magnetometry tests could be conducted with

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[69] The Dinaric Alps.
[70] The Neretva River.
[71] Now called Korčula.
[72] The town of Korčula.
[73] Now called Hvar.
[74] From the H. L. Jones translation (1954), Harvard University Press.

minimal impact to the area. However, it was recently pointed out (Radić and Bass in press) that the soil deposition in this area is quite extensive and could therefore slightly complicate the notion of rapid or shallow sub-surface investigations. As a minor anecdote concerning the Lumbarda polje, it might be no coincidence that the name of the wine derived from the grapes from the fields, known as *Grk* (Greek), renders the surrounding areas highly suspect.

10.1.2 The Issian Colony

The later Issian colony supposedly established in Lumbarda had land divisions mentioned in the famous "Lumbarda *psephisma*" inscription found on Koludrt hill (see Kirigin 1990: 312). The inscription details 4.5 *plethra* of land being given to over 200 colonists, as well as land within the town walls[75]. As mentioned previously, this colony has also not been detected. There are some indications, such as the presence of a contemporaneous cistern on the Koludrt hill where the *psephisma* was found, two contemporaneous Hellenistic graves found ca. 100 m. south of Koludrt[76], and fragments of Hellenistic pottery found in the area during KARG survey, that there must have been some Greek activity in the area.

Zaninović (1980/81: 92-93) has mentioned apparent regularities in the land divisions visible in aerial photos (AP) of Koludrt and on the landscape near Lumbarda. The author has printed a more recent AP of the entire Lumbarda peninsula (plate 1) which clearly gives some evidence of regularity (e.g. right angles and somewhat even spacing in the field walls and paths). These regularities are also visible on 1: 25,000 and 1: 5000 scale maps as field walls and access roads which appear to conform somewhat to quadratic alignments.

However, the situation in Lumbarda is by no means as clear as that found on the Stari Grad plain on Hvar[77] where it has been shown that the Greek field divisions are even visible from LANDSAT satellite images (Gaffney et al. 1994: 49). This is partially due to the fact that Lumbarda lands are intensely sub-divided and that there are not many visible standing walls which currently serve as land divisions on the polje. The first procedure suggested by Zaninović 1980/81: 93) for the Lumbarda investigation would consist of simple tape measurements of the so-called regularities to see if they conform to the 4.5 *plethra* lots mentioned in the *psephisma*. However, these measurements have still not been performed. Basically, it would appear that

[75] See Rendić-Miočević (1965: 77-81), Rendić-Miočević (1966: 133-141), Lombardo (1993: 161-188), Cahill (1993: 345-346); and Fraser (1993: 167-174) for further minor details concerning the *Psephisma* and related archaeologic information.

[76] See Kirigin (1990: 311-312) for a brief overview of the archaeological investigations and a general map of the Lumbarda area.

Zaninović's observations are in fact correct concerning a type of regularity, but it still remains to be seen as to whether these are the former Greek land divisions mentioned in the *psephisma*. Foot survey in the Lumbarda area has yielded only one fragment of Hellenistic black glazed ware which was found near a destroyed Roman villa rustica on the edge of the Račište Bay (KL-005).

10.1.3 Other Greek Find Contexts on Korčula Resulting from this Research

In the Vela Luka area, a few minor Greek find spots can be reported. The first find consists of a sole potsherd dated as a Late Archaic/ Corinthian fragment[78] . This piece, as well as numerous Bronze and Iron Age sherds, were found in the excavations for a house foundation (family Marinović/ KV-007) at the base of Sv. Ivan church (Gradina). However, due to the disturbed nature of the soils, this deposit is more than likely a secondary type that originated from the Gradina where the prehistoric, Roman, and Benedictine occupational materials are documented as KV-006. While Corinthian pottery is not unknown to Korčula, such as the *oinochoe* found near Blato (Lisičar 1973: plate T. IV, 10), finds dated this early are quite rare.

Earlier investigations have detailed the general archaeological situation on Kopila/ KB-017 (Radić and Vuletić-Vukasović 1887: 109-111, Lisičar 1949: 38, and Nikolanci 1989: 75). However, these investigations were rather vague. Therefore, the author and Prof. Radić set up a small sounding not only to explore the sub-surface integrity but also to assess the past agricultural impacts of the area.

Figure 84 illustrates the position of the sounding on the south slope of Kopila. Surface artifacts can be found on the site although not in great quantities. The sounding measured 50 cm. x 50 cm. with a depth of 38 cm. The top stratum was identified as a medium brown humus topsoil with an abundance of organic inclusions. The lower stratum was a darker silty loam with minor organic intrusions from the previous (upper) stratum. The sounding was terminated on contact with limestone at a depth of 38 cm. The artifacts and soils appear to be in secondary deposit, as modern artifacts such as rifle cartridges and wire fragments were also found in the upper part of the second (lower) stratum. Agricultural activity on the slopes of the Kopila area has ceased, although there are a few olive trees in the area. More extensive plans of the sounding were not made due to the rather poor state of the sub-surface deposit.

In any case, the small test unit yielded more than 100 prehistoric pottery fragments, assessed as Late Iron Age and generally conforming to earlier observations

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[77] See Zaninović 1980/81: 91-95 for an overview of the Stari Grad land divisions and the investigations that lead to the discovery that the original system was Greek and not Roman.

[78] All Greek and Gnathia wares were examined at the Split Arheološki muzej by Dr. John Hayes of the Adriatic Islands Project (AIP).

for the Blato area of Korčula (see Wilkes 1992: 51). Ceramic spindle whorls (fig. 48) were also found, but these do not tend to be diagnostic, as similar artifacts are known from regional Bronze Age sites as well (Čović 1991: 65). Approximately 200 small and medium mammal bone fragments (mostly ovicaprid) were recovered. The small unit also yielded numerous shells (primarily *Patella*), small sea cobbles, amphorae fragments, and 24 ceramic fragments dating from the Late Archaic, Classical, and Hellenistic Greek periods.

A point of interest is the fact that these finds do tend to reflect a similarity with artifacts that were discovered on Korčula in 1867 at or near the Potirna Gradac (KB-003), also situated on the west end of Korčula. Eight complete vessels, both local and imported (Illyrian and Greek/ Gnathia) wares, were recovered by a local farmer and a description of the vessels has been offered (Radić and Vuletić-Vukasović 1887: 109-111). Unfortunately, the present location of these finds is unknown. However, both the author and Prof. Radić, during review of the description given in this older text and its accompanying illustrations, believe that the illustrations might have been labeled incorrectly and therefore do not correspond exactly to the citations in the text.

The latter point is rather mute but the finds do reflect the presence once again of native and foreign wares being found in the same context. Of course, the implications of this occurrence can not be reasonably examined until further investigations are conducted. It is of particular interest to note that recent finds from the excavations of the Talež hillfort on the island of Vis suggest either direct Greek resource exploitations in the area, direct local trade with Greece, or contact with local communities who in turn traded with Greece (Čače et al. 1995: 8). The finds from Kopila (KB-017) and Potirna Gradac (KB-003) might reflect this local scenario. Perhaps the wares reached Korčula in an indirect manner, through Greek trading with the local Illyrians. It is of interest to note that both of these sites are on the western end of Korčula, directly adjacent to Vis.

The possibility cannot be ruled out that this area might be Novak's suggested position for a Greek colony. Greek finds are known from the upper strata of Vela spilja, which is situated just above the Vela Luka bay. A copious amount of fibulae have been recovered from "somewhere" in or near the Blato area. This area could actually be near the entry point onto the Blatsko polje from the Vela Luka bay (see fig. 3). Directly above this position is the Kopila complex hilltop structure with the previously discussed Greek finds. A Corinthian *oinochoe* was found near the Blatsko polje (Lisičar 1973: plate T. IV, 10), but unfortunately, the original location of the find is not known. It can be assumed that since the vessel is complete, it was more than likely exhumed from a grave. The numerous fibulae from the area, now stored in the Dubrovnik Museum, also including numerous silver examples (Čečuk and Radić 1995: 51).

10.1.4 The Heraclean Colony

Another point to be made concerns the problem of location of the Greek colony of Heraclea, mentioned by pseudo-Scylax (Periplus, ch. 22). The reference of "Heraclea with a port" has been open to debate for some time. Kirigin has summarized the general problem concerning this colony (1990: 294). Bonačić-Mandinić has discussed the coins minted at Heraclea which are currently held in the Arheološki muzej, Split, and suggests that Hvar would be a good location for the Heraclea colony (1988: 65-80). However, Rendić-Miočević has put forward a possible location for Heraclea on the bay of Vela Luka (1980: 235).

The aforementioned Greek finds from the area near Vela Luka specifically from on and near Kopila by no means indicate that this might be the location. The fact that Heraclea has a port is no use as a geographic description, since it is well known that the islands and coast have hundreds of bays and harbors in a wide array of sizes and depths. However, it is important to take Vela Luka's situation into account. The only other bay of that size which also offers protection and adjacent agricultural lands for a colony is the large bay at Stari Grad on Hvar. If both of these factors were needed, as indeed they would have been, then Vela Luka should meet the requirements. Furthermore, unless there was some confusion in antiquity, the Stari Grad location can be negated in the Heraclea debate since this was the site of the Pharian colony of 385-384 B.C. (Diodorus Siculus XV, 13-14)

10.1.5 Greek Structural Data on Korčula Collected During this Research

New data has been collected during this research which indicates some Greek influence on local protohistoric structures. This is not to imply the presence of a Greek colony, but rather the appearance of structural aspects of Greek tower structures known as *phryktoria* (see Adams 1982: 71). Similar structures are known from the island of Hvar (Kirigin and Popović 1988), albeit those examples fit the Greek typology much better that the examples from Korčula since the Hvar variants were built by Greeks from the colony at Pharos.

The Velo Gračišće-Dubrovica structure on Korčula (fig. 81) has clearly been built over an earlier prehistoric hilltop structure. The site overlooks the large bay of Brna and has an excellent viewshed to the surrounding seas. Minor clearing of the limestone tumble revealed a dry-stone quadratic-shaped structure. Although many of the stones have been dressed to fit the structure and the platform surface, the preparations should not be seen as diagnostic Greek *anathyrosis* until further analysis. One black glazed ware skiphos handle was recovered in the tumble, and numerous well-worn fragments of local Bronze/ Iron Age pottery were also collected on and near the hilltop. This structure

in no sense compares in size to the Greek watchtower Maslinovik, excavated on Hvar[79]. The tower might be a small and crude local Illyrian replication of the type, while recent observations from other Dalmatian islands tend to support this theory (cf. Gaffney and Stančič 1991: 78). Nevertheless, the standardized quadratic shape and the presence of a skiphos handle on the Velo Gračišće-Dubrovica site suggest that this structure might have a contemporaneous connection with Greek colonial activity on Korčula.

The nearby KS-011 structure (see fig. 75) is quite similar to Velo Gračišće-Dubrovica although much smaller. The position overlooks the Morkan polje and the sea approach to the Brna Bay, although the viewshed is slightly different than KS-010. No pottery was recovered at this site and as the database description details, the recent use of the hilltop as a geodetic survey point has obscured much of the evidence. A fragment of very poor quality jasper was collected near the site, although there does not appear to neither be any quarrying activity in the area nor were any other fragments of the material observed.

In any case, both of the structures are situated on rugged hilltops but it does not appear that the structural height on either exceeding two meters. To make the matter even more confusing, these two structures are located only 1.3 kms. away form each other. This point tends to reflect potential hilltop communications and other inter-visibility aspects that should be explore with a GIS. However, the connections to Greek communities, if any, are not presently clear.

10.2 General Roman Data Gathered During This Research

The main aspects of the Roman occupational evidence on Korčula are illustrated on figure 90. There are currently 28 documented villa rustica sites. The assessment of the villa sites is usually predicated on the presence of cementum in the surrounding area. This would imply a former structural presence in the area. Since many villa sites have no visible standing walls, this parameter was applied as a diagnostic parameter to generally assess the Roman evidence. Numerous Roman sites documented on Korčula did not necessarily meet this criterion. Localities such as these might be associated with ancient cisterns, limestone quarrying loci, bays or ports, or might be associated with the Roman road system on the island. The latter is visible in only a few sections of Korčula's landscape but is discussed in Section 9.3.

Since the point of this preliminary research was to assess the basic nature of the Roman evidence, many aspects are still unexplored. The presence of many inland villas tends to suggest that there must have been some established communication routes into the interior of the island. Unfortunately, since the contemporaneity of these farming

[79] See Kirigin and Popović 1988: 177-189 for a complete description of the type found on the island of Hvar.

sites is not entirely clear, it is difficult to project what the cultural landscape would have looked like during these times. The general lack of Late Iron Age local pottery (Illyrian), both in and around the villas, is perplexing. Certainly if the protohistoric evidence given by Diodorus Siculus concerning Hvar is to be taken as the example (XV, 13.4-15, 14.2)[80], then there is no reason to doubt that there should be local islanders living on the island at the same time as either Greeks, or slightly later, Romans. The archaeological record does not reveal any clear evidence concerning the nature of Roman and Illyrian connections.

However, the Potirna polje on Korčula might have some prospects for an investigation into this topic. The well-documented prehistoric evidence in the area has already been discussed concerning the numerous tumuli and the hilltop Gradac. It is interesting to note that a canyon that divides the southern half of the polje appears to also be the geographic boundary between a sizable cairn field on the eastern side and a large villa rustica on the western side. Once again, contemporaneity runs a major interference in the situation. However, the author has collected prehistoric sherds among the Roman ceramics near the KB-023 villa. Clearly, the archaeological picture needs much more investigation.

Another area of Korčula which has yielded interesting evidence is the bay of Uvala Račište, just below the Koludrt hill in Lumbarda. Two new Roman sites (KL-005-006) were discovered by the author and Prof. Radić just prior to the placement of the island's fiber-optic cable. Both standing villa remains and a sizable ceramic scatter indicate that these sites (possibly a continuum of one site) were quite active. Both sites are situated directly on the shoreline and due to the fact that local building is somewhat limited, a reasonable transect survey would be possible in the future.

10.2.1 Non-Villa Structural Evidence: Roman Contexts

One of the more intriguing Roman sites documented during this research consists of a small dam found at the head of a canyon that leads from the Potirna polje down to the sea, eventually emptying into the bay of Gradača (fig. 3). The surviving

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[80] "...While these events were taking place (Dionysius the Elder linking with the Illyrians and Molossians in Epirus), the Parians, in accordance with an oracle, sent out a colony to the Adriatic, founding it on the island of Pharos, as it is called, with the cooperation of the tyrant Dionysius...At the conclusion of the year, in Athens Diotrephes was an archon and in Rome the consuls elected were Lucius Valerius and Aulus Mallius, and the Eleians celebrated the Ninety-ninth Olympiad, that in which Dicon of Syracuse won the "stadion". This year (ca. 384 BC) the Parians, who had settled Pharos, allowed the previous barbarian inhabitants to remain unharmed in an exceedingly well fortified place, while they themselves founded a city by the sea and built a wall about it. Later, however, the old barbarian inhabitants of the island took offense at the presence of the Greeks and called in the Illyrians of the opposite mainland. These, to a number of more than ten thousand, crossed over to Pharos in many small boats, wrought havoc, and slew many of the Greeks. But, the governor of Lissus appointed by Dionysius sailed with a good number of triremes against the light craft of the Illyrians, sinking some and capturing others, and slew more than five thousand of the barbarians, while taking some two thousand captive..." Oldfather, C. H. translated (1954), Loeb Classical Library.

structure runs in an almost east to west alignment that is perpendicular to the direction on the canyon. Further clearing of the brush near the structure during the Summer 1996. revealed that the dam is ca. 10.60 meters in length and ca. 1.10 meters in height at the highest preserved point. However, the majority of the surviving structure is ca. 70 cm. in height from the foundation stones to the top course. The dressed limestones in the structure are held together with cementum and arranged in the *opus insertum* fashion and it appears that the feature is ca. 1.5 cm. wide. Modern terracing and agricultural activities in the area have possibly damaged the top of the structure. No excavation was conducted at the site, so a complete assessment of the full extent of the feature cannot be offered.

It appears as though the small structure has been purposefully built according to the canyon's topography. Specifically, this structure could be classified as a soil or landscape control device. It has been clearly and strategically positioned to hinder soil from exiting the polje, via the small canyon, and eroding towards the shoreline. Pithoi, amphorae, and tegula sherds were also found near the structure, probably transported in alluvium from the polje above. It was noted that the soils on the northern (i.e. polje) side of the dam were fully deposited up to the top of the structure, while on the south side of the dam (i.e. downslope), the soils were just flush with the foundation stones of the structure.

The importance of this site to the study of Korčula's landscape modifications during Roman times and the later environmental impacts has not yet been fully investigated. This structure is obviously not a terrace or field wall. If further investigations do prove the function implied here, then this has direct implications on understanding the extent to which the Romans had to control the landscape in order to maintain the soils on the polje. Likewise, it would appear that this structural device is still serving its original function, as the nature of the deposits would suggest.

This would clearly have some influence on the understanding of the palaeo-pedological aspects of the island and adjacent areas. Throughout Dalmatia, it is generally believed that it was not until the Roman times that various anthropogenic factors began to take their toll on the surrounding landscape (cf. Beug 1961; Brande 1973; and see Batović and Chapman 1985: 158 re: archaeological record). However, in the case presented on the Potirna polje, it would appear that the Romans needed to contend with soil transport as well.

It would be appropriate to suggest a few scenarios that would account for the need of the Romans living in the Potirna polje to construct such a device. The Romans could have been the primary environmental impact to the landscape of the surrounding area and therefore the dam required construction to deal with soil problems created

during these occupations. Alternatively, the Romans could have inherited these pedogenic transport problems from preceding Iron or Bronze Age agricultural practices on the Potirna polje.

It is safe to assume that the Romans primarily cultivated on the polje since the surrounding hillsides are quite steep and rugged. During this research, there have only been a few cases found on the island where modern local farmers have detailed erosional forces acting on the soils *while the crops are under cultivation* (author's emphasis). This would indicate that either the Romans were dealing with very localized high-energy pedogenic factors which were unique to that field and the surrounding terrain, or the Roman inhabitants came across a previously cultivated and abandoned landscape. This would imply pre-Roman agricultural practices specific to that area. The archaeological record in the area supports the theory concerning pre-Roman use of the Potirna polje. Therefore, the evidence tends to indicate that the Romans were not the first cultivators of this field.

Without surviving field systems such as those on Hvar, is fairly difficult to assess the extent of land use on the island. Strabo commented that the Dalmatian islands, in control of the Illyrians, were:

> "sunny and good for fruits, for the olive and vine flourish there, except, perhaps, in places here and there that are utterly rugged. But, although the Illyrian seaboard (Dalmatian islands) is such, people in earlier times made but small account of it - perhaps in part owing to their ignorance of its fertility, though mostly because of the wildness of the inhabitants and their piratical habits."(7.5.10).

While this example can by no means suggest that Korčula was not terraced or farmed until the heavy Greek and Roman contact after the 4th century B.C., it can lend to the idea that much of the surrounding lands or hillsides were still unmodified for certain farming practices. However, the archaeological evidence on the Potirna polje supported by certain lithic finds from numerous Bronze and Iron Age sites (see figs. 50-52) indicate that agriculture of some kind was definitely occurring in the area prior to Greek and Roman contacts.

10.2.2 New Underwater Evidence: Roman Contexts

Although the constraints of this research definitely limited the nature of underwater investigations, numerous underwater surveys were conducted within fairly controlled environments. The author had the opportunity to make a few SCUBA investigations during the Summer 1993 season just outside of Pupnatska luka (fig. 3). These preliminary dives allowed a general understanding of the surrounding waters.

Follow-up survey was then conducted on the surface with mask and snorkel[81] . Transects made across the bay of Pupnatska luka revealed numerous Roman ceramic finds consisting mainly of well worn amphorae fragments.

A local fisherman and landowner in Pupnatska luka (Milé, *ex* Pupnat) told the author that a friend of his had pulled out an old anchor from the mouth of the bay. The description of this find is very similar to the known Roman lead anchors found in the nearby waters, including one stored at the Arheološki muzej in Vela Luka. Survey along the shoreline of the bay did not reveal any clear archaeological finds. The small terraced fields to the east of the bay were briefly checked, but the local farmer was hesitant due to active crops in the soils. Off-season survey is planned for the future, as this bay is one of the best protected on the island and would make an ideal site for either prehistoric of protohistoric activities.

Snorkel survey in the waters of Poplat Bay (U. Poplat), situated on the west end of Korčula, has also revealed Roman pottery . A villa has previously been documented in a well-situated field above the bay (Oreb 1972: 130), so these finds only confirm that the south side of the bay was one location of local Roman activities. Likewise, a nearby shipwreck (KB-041), if the Roman identification is correct (Dinko Radić pers. com.), would surely have links to the nearby villa and the well protected bay.

[81] Underwater visibility in and near Pupnatska luka can often exceed 30 meters.

Chapter Eleven

Specialized Analysis Conducted for this Research

11.0 Specialized Analysis and Results on Materials Sampled for this Research

The author has described on numerous occasions in this thesis the major areas of research which are tremendously lacking, both on Korčula, the adjacent islands, and the immediate coast. These points have been indicated to explain in as clear a manner as possible that numerous aspects of the natural or archaeological record that might be well understood elsewhere in the Mediterranean Basin, have yet to be investigated on the Dalmatian Coast. Areas which completely lack or are otherwise short on data include: well sampled and accounted for ^{14}C dates, intensive and quantitative faunal and floral analysis, soils deposition studies, and more intensive pottery analysis, to name just a few. It is apparent that most of these aspects and many others would require inter- and multi-disciplinary research and collaboration.

Obviously, in a study as limited as this thesis, it would be impractical to attempt numerous and unassociated specialized analysis on many different fronts. Limited data collection and the costs of specialized analysis prevented extensive investigations. In any case, the author determined that it was in the best interests of both local studies (Korčula) and regional studies (Dalmatian Coast) that a path should be laid to facilitate future specialized studies centered around, but not necessarily exclusive to, archaeological research.

11.1 The Stiniva Bay Pedogenic Horizons: The General Nature of the Deposit

Section 3.5 briefly detailed the location of well-stratified pedogenic horizons on the bay known as Uvala Velika Stiniva (u.v. Stiniva: KV-034). The fact was mentioned that nearly all geologic sub-surface evidence on the island consists of only two pedologic horizons. The numerous hillside cuts made for the island's tarmac roads usually expose these two soil horizons, but in almost all cases, nothing else can be gleaned from the exposures.

These horizons noted in the road cuts are generally known as the "A" or the humus horizon, and the "C" horizon, commonly recognized as bedrock. Together, these form a soil profile known as an A-C horizon. The A horizons on Korčula have been found to have more than 1 meter of deposit that are clearly discernible with makija and grass rootlet intrusions extending down to the bedrock. However, these soils are surface-type

humic soils. The "B" or true sub-soil horizon is virtually absent in many of these road cut profiles.

In the course of the survey, clay outcrops or exposures have been sought for sampling, primarily as a means for mineral content analysis and provenance (or attempting to source) materials which could have been utilized in prehistoric pottery. True clay sources are not well documented on the Dalmatian islands, and Korčula seems to reflect this situation. However, a few of the villagers from Vela Luka confirmed the location of a clay outcrop on the northern coast of the island at a position called Uvala Velika Stiniva or "the larger bay of Stiniva" (see site KV-023 in appendices, and fig. 7). In the past, school children from Vela Luka hiked to the outcrop to gather clays for school projects and this appeared to be an ideal scenario for a study. As will be detailed later in this chapter, the well-known cave of Vela spilja happens to be situated above the village of Vela Luka. It seemed that if modern children can walk to collect clays at the position, there should be no initial reason to exclude earlier residents of the area from the same resource. Naturally, many pedological, mineralogical, and environmental conditions would need to be investigated in order to make this theory even remotely acceptable.

The site is situated just above a narrow cobble beach that fringes the bay. The headlands leading down to the shore are quite steep, as the entire bay itself is at the base of a small canyon that opens out to the sea. The nearby landscape above the site, to both the east and west, has been terraced. Most of these areas are currently abandoned, but in a few places, agriculture is present. Other areas nearby have small fishing houses and summer homes. It appears that a significant portion of the landmass in the canyon (ca. 3 hectares) has slumped roughly 5-10 m from the surrounding canyon slopes. Numerous pedologic sections can be identified along an area of ca. 100 m. in length above the shoreline, although the exact reasons for the profile's exposure are not entirely clear.

In any case, this allowed a rare opportunity to document a fresh pedogenic profile from the Dalmatian islands. The author has prepared a profile for this thesis which indicates the general nature of the exposure along Uvala Velika Stiniva. This illustration, taken from a position designated S3 along the shoreline (fig. 6) should be consulted along with the text descriptions. Standardized geological and pedological descriptions were applied (see Keeley and Macphail 1981: 225-241)[82] and color variations were based on a standard set of Munsell Soil Color Charts. The horizons have been labeled (A1, A2, B1, etc.) by one of numerous methods that have been employed in soil

studies[83]. Naturally, alternate methods could be applied, but these would not change the nature of the deposit.

Most of the associated descriptions were made with the soil samples both wet and dry. This was done for comparative purposes in the event that these or similar soils happen to arise in varying archaeological or geological contexts elsewhere on the island and require reliable identification and association in both wet and dry field environments. The profile illustrated at position S3, which includes a sampled clay horizon from B2, clearly indicates that varying materials have been deposited.

The horizons of B1 and B2 are both variations of clays, but B2 is the only one that was identified in the field as true clay. B1 has slightly higher traces of silt and sand in the sediment, hence these soils are actually closer to loamy-type clay. The B1 clay had extremely small calcareous inclusions (calcite crystals), with most detectable only with a hand lens. Samples of the clay from the B2 horizon were also taken for x-ray fluorescence (XRF), x-ray diffraction (XRD), and sediment analysis, which will be discussed later.

The B3, B4, and C1 horizons all have limestone inclusions, but there is a definite disparity between general size and appearance of the inclusions. The B3 horizon has limestone inclusions that are in the 1.0-20.0 cm size range, with sub-rounded, platy, and blocky shapes. The B4 horizon has limestone inclusions in the 1.0-30.0 cm size range, but many of these stones are more rounded, possibly suggesting more wear from transport or source related effects before final deposition. The visual organic materials identified in B3 extend into B4, but this can be expected in profiles of this nature, as roots can often extend several meters in depth.

There is a marked difference between the general inclusions of B3-B4 and those found in C1. The C1 horizon has almost no soils, although those present did have more sandy qualities in the loam. The limestone inclusions ranged from only 0.5-5.0 cm in size and were extremely platy (i.e. flat and blocky). The orientation of the stones (flat or parallel with the horizon) was generally the same as B3 and B4, but in some positions, the inclusions were deposited at a 45° angle to the horizon.

This would suggest relative uplifting of the horizon at some point during the deposition. Plausible theories could be a higher energy depositional environment, post-depositional uplifting, or abutment with a deposition perpendicular to the current one. The situation should be investigated further before any conclusions are drawn. Another point to note is the complete lack of visible organic material in the C1 horizon.

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[82] The standard British tripolar graph was employed to differentiate between percentages of silts, sand, and clays. Likewise, the standardized British system of particle size analysis (BS 1377) was used to delineate sands, silts, and clays.

Before moving on to the specialized analysis, a point should be made about the soil colors and evidence of transitions in the pedogenic profile. The soil Munsell values, throughout the entire profile, vary greatly with little graduation. Although many factors can affect soil color throughout a profile, such as iron content (Fe^{2+}, Fe_{3+} , etc.), soil burning, or parent material source color, the Stiniva profile shows no evidence of gradual color transition areas, suggesting a facies change. The evidence so far would indicate both low energy deposition environments (clays) and possibly higher energy environments (the C1 deposit). Meanwhile, the A1 and A2 horizons are probably related to recent soil erosion from the surrounding landscape.

11.2 The Stiniva Bay Exposures: Specialized Analysis of Sampled Materials

It was recently noted that no soils studies have been conducted on the Dalmatian Coast specifically catering to archaeological investigations, and relatively few which cover even general pedological aspects of the East Adriatic (Chapman et al. 1987: 123). Therefore, it seemed appropriate to conduct highly specialized testing on selected sediments from the Stiniva exposures. The main goals of the preliminary testing were as follows:

1) To assess the nature of the materials that have been deposited at Stiniva, specifically regarding the depositional environment and the general pedological nature of the deposit.
2) Use the data from above to facilitate a general description of the local palaeo-environmental landscape.
3) Relate the data and conclusions drawn from both 1 and 2 to the archaeological record, if possible.

11.2.1 The Stiniva Bay Exposures: Sediment Analysis on the Clays

Three separate clay samples were collected from the Stiniva exposures for specialized sediment analysis. These samples have been labeled S1, S2, and S3. Sample S3 was taken from the B2 horizon shown in figure 6. Due to time constraints, the other samples (S1 and S2) do not yet have accompanying pedogenic profiles, although these are planned for future research by the author.

Chris Minty processed the clays at the University of Edinburgh, in the Physical Geography Laboratories of the Department of Geography. The preparation procedure of the samples along with the British Standard particle size class divisions (BS 1377) have been detailed in figure 43. After treatment and preparation, the sediments were then analyzed in a SediGraph particle size analysis system[84] .

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[83] In this case, a basic system used in the USA. A = top soils, B = sub-soils, C = bedrock, with related transition zones (A1, B1, B2, C1, C2, etc). See Joukowsky (1980: 15-16) for the archaeological uses.

[84] The machine used for the analysis of the Stiniva samples was a Micromeritics 5000ET SediGraph Particle Size Analysis System. Results were printed out on special particle size distribution graph paper designed for the Micromeritics SediGraph machine (see figs. 40-42).

Essentially, the SediGraph uses a fixed position x-ray source and detector to measure the gravity-induced travel rates of different sized particles held in a liquid with known properties. The liquid and processed sample are encapsulated in a transparent cell and an x-ray is passed through the medium. Essentially, the sizes of the sediments are determined by measuring the velocity rates of the particles as they fall through the liquid. The rate at which the particles fall through a liquid is based on the principles outlined in Stokes' Law (Hsü 1989: 25-26). In short, this law states that the largest particles fall at the fastest rate through the liquid, while the smallest particles fall at the slowest rate. Since the individual particles rarely have a uniform shape, the particle sizes, which are shown on the output of the SediGraph (see figs. 40-42), are listed as "Equivalent Spherical Diameter".

Although the results from the three clay samples (S1, S2, and S3) varied, there are consistencies that relate to the nature of the deposit. Post-output results can normally plotted on a standard tripolar graph similar to the one illustrated in figure 44. However, since all three samples completely lacked sands, a standard bar graph reveals the results in a more concise illustration (fig. 45).

The exclusive presence of clays and silts in the selected profiles indicates an original depositional environment that was low-energy. Areas where similar depositions would be anticipated, include both semi-stagnant estuarine environments (wetlands, lagoons, marshes), and lake and pond environments. Generally, the variations within the Stiniva samples would reflect a combination of both regional environmental changes and localized events. However, it should be kept in mind that the actual sedimentation process at Stiniva is more than likely based on localized events. Further quantified testing of the three clay horizons and the alternate horizons (*e.g.* sediment analysis, ^{14}C, palaeoflora, palaeofauna, etc.) would give a better regional and temporal framework.

Preliminary results from this analysis indicate a geologic phenomenon that appears throughout karst regions, and more specifically, along the Dalmatian Coast. Section 3.1.1 outlined the geomorphological feature known as a dolina. These features are common on the Dalmatian Coast and often appear as collapsed domes or sinkholes in the karst, which can fill with water, soils, or both. The well documented dolina which yielded important palaeo-environmental data for the Central and South Dalmatian islands and coast was detailed in Chapter 4. This site, known as Malo Jezero, is situated on the eastern end of the nearby island of Mjlet. The research conducted there indicates that sometime around 2250 BP (uncal.), part of the freshwater dolina might have collapsed, causing the freshwater lake to be rapidly flooded with seawater.

Naturally, a change in local sea levels could have precipitated this event, in which case a collapse might have occurred after the heavy inundation by the sea. In any

case, Beug's research (cf. 1961a, 1961b, 1967) revealed that the former near-shore freshwater dolina started out as a sedge bottom doline. The feature had filled with fresh water and a low energy sedimentation process began above the basal sedge peat. The sediments examined in the Malo Jezero cores revealed horizons of both a calcareous and clayey nature, including varved gyttjas [85]. More importantly, the local pollens which formed the basis for Beug's research were sealed in the well-stratified lake bed deposit. As explained above, some time around two millennia ago (the time at which the fresh water lake sediments abruptly ceased to be deposited) the doline was inundated by the sea and presently remains in this state.

Given the nature of the surrounding geology and geography near Uvala Velika Stiniva, there is reason to believe that the pedogenic exposures could be the result of either a collapsed or slumped dolina that has been partially inundated by the sea. There is a small islet off the shoreline and directly adjacent to the Stiniva exposures. This islet is ca. 300 m distant and opposite the current shoreline, and of particular interest is the bathymetry around this geological feature. While most of the surrounding seas are in the 6.0 m. depth range, a substantial portion of the seabed between this islet and the shore is barely in the 1.0 m. depth range. It would be reasonable to suggest at this preliminary stage that the small islet could be the remains of the northern edge of the now collapsed and inundated dolina. While these factors indicate that this might be the case, the situation requires much more specialized investigation to be more fully understood.

So far, the general pedological nature of the Stiniva exposures has been assessed and a general description of the local palaeolandscape has been offered. It is now possible to suggest relationships this data may have to certain aspects of the local archaeological record. Recent preliminary details of the faunal assemblage from the Neolithic levels in Vela spilja have been published (Čečuk and Radić 1995). Likewise, the author has prepared a table which reviews the overall nature of the assemblage (see fig. 36), although as noted previously, quantified and chronological analysis have yet to be conducted.

It is interesting to observe not only the presence of estuarine shellfish, which occur in numerous Dalmatian Coast assemblages, but also specific birds which are exclusively associated with freshwater lake and estuarine environments. Certain avian remains have been identified in the Late Neolithic Hvar Culture levels of Vela spilja (Čečuk and Radić 1995: 27), although avian remains are known from earlier Neolithic phases. The remains consist of wild duck, egret, and heron. It was previously

[85] Gyttjas are described as rapidly accumulated organic muddy deposits normally found in eutrophic (nutrient rich) lakes.

mentioned in this thesis that these resources could be linked to the nearby Blatsko polje, which was until recent times a wetlands. However, due to the fact that the Stiniva Bay is less than 2 kms from Vela spilja[86], this could also serve as an area for the estuarine resource exploitations reflected in the Vela spilja Neolithic faunal assemblages.

11.3 Stiniva Bay Clays and Neolithic Pottery from Korčula: XRF & XRD Comparative Analysis

The general use of x-ray fluorescence (XRF) & x-ray diffusion (XRD) in archaeological research has been detailed in numerous sources (e.g. Hall 1960, Hall et al. 1964, Tartaglia 1989), so a complete overview of the background and general uses is out of the scope of this thesis. Specifically concerning pottery, clays, and their archaeometric analysis, many well-quantified statistically based studies have been conducted in recent times (e.g. Birgül et al. 1979; Kilikoglou et al. 1988; Mommsen et al. 1988). Likewise, numerous mineralogy texts detail the nature of the scientific techniques employed for this type of research (e.g. Jones 1987).

It has been noted that the results of pottery and clay provenance studies can provide insight into the distribution of workshops, diffusion of people, influence of cultures, trading routes, and contact between different sites (Kilikoglou et al. 1988: 37). Closer to Dalmatia, non-X-Ray based mineralogical examinations on Neolithic ceramic assemblages should not go without notice (see Klopčić 1988: 201-209). However, XRF use has been limited to only one pioneering study overseen by Grga Novak on the island of Hvar during the early 1950s (see Karšulin 1955: 347-354).

The accepted approach to the use of either XRF or XRD analysis on both clays and pottery is centered around multivariate statistical analysis of a large number of samples clustered into a smaller number of mutually exclusive groups (Birgül et al. 1979: 204). The so-called "fingerprinting" of pottery or clays is based both on trace element percentages and similarities or differences of mineralogical inclusions. The general theory is that sherds with similar chemical constituents could be from the same or very similar pottery workshop that used the same or similar source materials. In theory, this could facilitate a sound provenance study.

However, many problems arise in both the sampling process and the assessment which have been pointed out by Mommsen et al. (1988: 47). The abundance values (of the element composition data) are measured with an experimental error in the final output. Furthermore, the trace and minor elements are rarely distributed homogeneously in the clays contained within a certain clay bed or horizon. Hence,

[86] It takes ca. 20-30 minutes to walk from Vela spilja to the Stiniva Bay area. Geographically, the site is actually closer than the Blatsko polje.

samples taken from certain spots in a given clay horizon might not completely represent the overall trace and minor element signature of the stratum. A general increase in the trace element concentrations also occurs through both purification and firing of the clays depending on the nature (fine or course) and chemistry (Kilikoglou et al. 1988: 45).

Regarding the pottery, Mommsen et al. (1988: 47) point out that sherds from the same place of manufacture show a range of elemental concentrations with an *a priori* unknown distribution. Likewise, sherds produced at different places may display similar or partially overlapping concentration values of some of the elements. To complicate the matter even further, unlike natural samples used for geological analysis, pottery analysis must take into account the pottery manufacturing process. For example, the addition of temper materials to make a clay material more plastic will change the elemental concentrations and hence, a sample (or samples) can be wrongly grouped in the multivariate statistical groups.

It has also been detailed that the most accurate methods of testing would involve the comparison of the ceramic data set to natural clays from the area surrounding the site of interest (Kilikoglou et al. 1988: 37). Therefore, given the fact that Vela spilja is less than 2 kms from the Stiniva exposures, it seemed appropriate to establish the groundwork for future quantified analysis of both local clays and pottery from nearby prehistoric contexts. It should be kept in mind that these explorations were done in a preliminary manner. Only 3 clays and 6 sherds were tested, so the results do not comprise a quantified sample analysis. However, many of the problematic issues involved with clay and pottery provenance studies specific to Korčula have been exposed through these tests which will be of vital importance in future studies.

11.3.1 The Pottery Selected for the Preliminary Trials

The pottery used in the tests was given to the author with permission from Dr. B. Čečuk and Prof. D. Radić. The individual sherd details have been included on figure 46, but a brief review of them will be given. Only two sherds were used from the small assemblage at Jakasova spilja. These sherds were labeled 1A (Impresso body sherd) and 4A (Hvar Culture body sherd). The Vela spilja sherds were labeled 2A (Hvar Culture body sherd with rim), 3A (Danilo/ Vela Luka Culture body sherd), 5A (Impresso body sherd with rim), and 6A (Impresso body sherd). The preparation of the clay and pottery samples, according to recognized procedures, as well as supervision of the XRF and XRD testing, was conducted by Fiona Stephen of the Department of Archaeology[87].

[87] The samples were tested in the Physical Laboratories of the Department of Geology, University of Edinburgh. Laboratory procedures were controlled by F. Stephen.

Once again, since the results are not quantified it will only be possible to point out general trends in the XRF and XRD results. As figures 46, 64, and 65 show, the general mineralogical values of the 6 pottery samples examined by XRF and XRD do have some variations which cannot be readily explored in the such a small sample group. However, a few of the areas where comparative analysis through XRD has revealed trends have been isolated and shown on figures 65 and 66.

Both pottery samples 1A and 5A show almost identical mineralogical values for both SiO_2 and $CaCO_3$. The $CaMg(CO_3)_2$ values illustrated show that this mineral (dolomite) is definitely present in 1A although only negligible in 5A. In any case, both overall XRD graphs for 1A and 5A clearly show the distinct similarities between the minerals found in these two sherds. As pointed out in the previous section, although pottery from different areas can have a similar mineralogical value, in this case there are two values that appear to occur in similar concentrations.

The samples are from Early Neolithic contexts on Korčula, so a very similar pattern might not seem surprising. However, it is interesting to note that the two samples were collected at different cave sites on Korčula. The 5A sample is from Vela spilja, while the 1A sample is from Jakasova spilja, and it should be noted that these sites are ca. 35 kms apart. If certain social manifestations, such as separate island communities existing within one recognized regional cultural group (see Čečuk 1986a and Čečuk 1989a), are to be investigated in detail outside of the traditional ceramic motif-based assumptions, then results such as this could be of great importance for future studies.

General trends can also be seen in the XRF trace element details from these sherds. Figure 46 details the main elements that were isolated for the study. It is interesting to note the similarities between sherds 2A and 4A. Both of these are Late Neolithic Hvar Culture sherds of similar color description and once again both have been sampled from different cave sites. Likewise, the Na_2O, K_2O, TiO_2, MnO, and P_2O_5, minor trace elements from both the 5A and 6A samples seem to be very similar. Both of these samples are derived from Vela spilja. It should be pointed out that the high percentages of SiO_2 are expected in most trace element studies, since this compound is normally present in all of the most common rock-forming minerals, and hence, a high percentage of geologic formations.

However, the high CaO percentages in the pottery can be expected, and are attributed to the inclusions of either crushed shells or limestone into the clays as a temper for the pottery. These high values were also noted in the XRF studies on the Late Neolithic materials from Grapčeva spilja on Hvar (Karšulin 1955: 352). Likewise, it was pointed out that the similar values seen in earlier and later pottery from Grapčeva

spilja could be due to a similar source material being used during both of these periods (op. cit.: 349). Once again, this tends to preliminarily support the notion of a localized community using local resources to make pottery that can be assigned to a larger regional cultural group.

The XRF results on the clays are fairly similar, and tend to indicate a general trend towards homogeneity (see fig. 47). The slightly higher levels of Na_2O in the S2 clay could be due to the fact that this clay horizon is almost level with the high tide mark. Hence, it is possible to suggest that the higher sodium levels could be due to the periodic invasion of seawater into the clay horizon. Also of interest is the fact that these source clays have relatively low traces of CaO in comparison to the pottery samples. Therefore, if these or similar clays were used in the manufacture of the local Korčula pottery, then the addition of shell or lime inclusions for temper would definitely be necessary to achieve a plasticity in the clays. If so, the relatively high values of these inclusions in the pottery would be expected.

The XRD analysis of the clays (fig. 67-69), shows that while S1 and S3 have almost identical mineralogical profiles, S2 does not necessarily have a markedly different signature. The three profiles given for each clay represent alternate tested samples. Essentially, this is done to alleviate the problem, discussed earlier in this section, concerning a discontinuous homogeneity that can be found in different areas of the same clay horizon. In the future, alternating samples should be taken from completely different areas of each clay horizon. In this preliminary study however, only three samples were taken, one from each horizon, so each sample was divided into three separate units.

Regarding direct clay to pottery comparisons, the XRD results indicate that there are clear similarities between the SiO_2 and $CaCO_3$ mineralogical values in both the 1A and 5A Early Neolithic sherds, and the S3 clay sample (figs. 65-66, 70). In fact, it is very difficult to observe the differences in the XRD values in the output. A visual inspection of the pottery XRF results also reveals that there are similarities between certain pottery fragments and the clay samples.

Numerous aspects were noted during this series of tests that must be observed in any future research using XRF and XRD. The encrustation that is prevalent in many of the Dalmatian caves is readily visible on many of the surface sherds in Jakasova spilja. Naturally, if the samples are not prepared properly for the XRF or XRD tests, the CaO values recorded in the pottery could be greatly affected. Similarly, it is not clear if unpurified water can have an affect on the sherds. If the pottery is washed in tap water in Vela Luka, then pronounced mineralogical variations might affect the final results. The effects of mineral solutions in tap water have been noted while processing films and

prints in the darkroom of the *Arheološki muzej* in Vela Luka. As noted earlier, the clays should be sampled from many different areas throughout the same horizon to obtain the proper trace element averages.

A brief examination of the Karšulin study done on the pottery from Grapčeva spilja on Hvar (1955: 347-354), reveals many further insights. It should be noted that these tests were done in what can be called the "genesis stage" of XRF and its uses in archaeological research. This study was conducted by a researcher at the former Yugoslav Institute of Silicates Chemistry in Zagreb. The results, although published before almost all known XRF studies on pottery, are objective in their conclusions.

It is interesting to note that the main reasons for the commissioned study were to determine whether the pottery from Grapčeva spilja originated from Hvar, and what raw materials and technological processes were applied to make that pottery (Karšulin 1955: 347). Both the early pottery (Late Neolithic) and later pottery (Eneolithic/ Early Bronze Age) were found to have very similar chemical compositions (op. cit.: 349). Although a clay source was not found close to the cave, another source was noted in the cave of Pokrivenik, on the northwest side of the island. Both caves contain contemporaneous pottery, so the use of the Pokrivenik cave clays for the analysis had sound archaeological reasoning. In these tests, not only were the clay samples tested, but also replications of the pottery were prepared and tested against the original Late Neolithic wares. It is surprising to note that the research team was able to make the pottery both out of clays and standard terra rossa soils with shell or limestone as the calcite source intermixed for temper (op. cit.: 350). Likewise, the firing temperatures, methods of firing, and hardness characteristics were examined in detail, as were modern potters who make a product quite similar to the Late Neolithic Hvar Culture types (op. cit.: 351-352).

A final note concerning this study are the investigations into the two reddish paints that were often applied to highlight the very finely incised motifs on some examples of the Hvar Culture pottery. These consisted of either a reddish-brown paint derived from ochres, or a light, almost neon-red paint that is derived from cinnabar. It was noted that although inland sources for cinnabar exist, there is also one source known from the nearby Pelješac Peninsula, near the town of Ston (*op. cit.*: 353-354). These same paints are also found on some of the Korčula variants of the Hvar Culture pottery.

In the future, it is hoped that both pottery and clay samples from Korčula and other islands such as Hvar, Lastovo, or the Pelješac Peninsula, can be used for a comprehensive regional comparison of the materials used during not only the Neolithic, but also later occupations as well. Regarding this study, it is clear that more pottery

samples must be obtained from the known assemblage from Vela spilja to investigate these results in a more quantified manner. Therefore, these results should only serve as a basic pilot study for future research. It is clear that if further socio-cultural data concerning the prehistoric cultures of the Central Dalmatian islands and coast are to be explored, then specific research techniques, such as the various sediments and XRF/ XRD analysis conducted for this thesis research, should be paramount to those studies.

Chapter Twelve

Summary and Conclusions

12.0 General Discussion, Summary and Conclusions

It was stated at the end of the introductory chapter that one of the primary goals of this thesis, in light of the fact that almost all prior research had been on a very small scale, was to establish a sound foundation for future archaeological research on Korčula. This goal has definitely been achieved over the 1993-1996 period of the author's research. Likewise, the many periods and areas of investigation covered during this research have definitely shed needed light on what was by far the least understood island on the southern Dalmatian Coast. However, it is also clear that the archaeological work must continue if further insights are to be revealed.

12.1 Palaeo-Landscape, Palaeo-Environment and Palaeo-Economies

Realistically, there is minimal evidence for large-scale cultivation or landscape modification that might have occurred before Greek and Roman contacts. The Illyrian tendency more towards piracy, with only a few later accounts of low scale animal husbandry, such as goat herding on the island of Brač (Pliny *HN* iii, 152; Wilkes 1969: 179), does not necessarily provide insight into Korčula's pre-Greek and Roman landscape. Essentially, the extent to which the island was landscaped or terraced prior to the Greek and Roman contacts is not clear. Even during the Roman period, terracing or farming as far as can be determined from the archaeological data was probably very local and concentrated mainly on and near the lowland *polje*. It has been explained in this text that the Greek centuriation system on the Stari Grad plain of the island of Hvar (see Zaninović 1980/1: 91-95, Kirigin and Slapšak 1985: 285-286, and Kirigin 1990: 296-297) does not yet seem to have a similar counterpart detected on Korčula.

The author's investigations have clarified that Korčula's extensively modified landscape has allowed the proliferation of soils into areas where natural accumulation might not have occurred at such extensive rates. Likewise, as nearby palaeo-environmental studies from the island of Mljet tend to indicate, it is only since Greco-Roman times that mass vegetational additions have been made to the local landscapes. This era brought the introduction of imported flora, a destruction of native plant species, and ushered in the growth of opportunistic varieties such as the evergreen *makija* into areas where the native vegetation had been destroyed.

It is clear that modification of the landscape to support a Greco-Roman culture, including heavy emphasis on olive tree plantation and clearance of hectares of natural vegetation to support the vineyards, definitely set the stage for post-Roman landscape erosion. The extent of this disruptive activity on the landscape, in the form of mass terracing, has been noted during large scale survey elsewhere in the Mediterranean, such as the Greek island of Keos (Cherry et al. 1991: 25-26, 59). Likewise, Vita-Finzi's overviews (1969) of anthropogenic soil depositions and the creation of new soil areas in the Mediterranean Basin are particularly applicable to Korčula, as well as the extreme impacts these erosions and depositions can have on the palaeo-environmental and archaeological landscape (Roberts 1989: 137-142).

On Korčula, lithic artifacts have been found at depths of up to 2.0 m in the *Sitnica* polje, due west of Smokvica. The author has also found lithic materials (see fig. 49) in shoreline terrace erosion on the north shore of the *Lumbarda* polje (Radić and Bass in press: a). Furthermore, Renaissance pottery fragments such as Majolica sherds[88] and much earlier black glazed sherds (Hellenistic/ Gnathia-type) have been found in a trench cut near Koludrt in Lumbarda (ibid.). So, it is quite clear that the impact of the soil transport and their relationship to the archaeological investigations on Korčula is only just now being understood.

Naturally, the many points noted above are not meant to imply that there were no agricultural pursuits on Korčula prior to the Greco-Roman era. Indeed, artifacts are known from both the author's survey, and Čečuk's excavations in Vela spilja[89], which indicate some sort of processing of the local floral resources. However, it is rather peculiar to note that there are relatively few artifacts known which relate directly to either the procurement or processing of agricultural materials.

There do not appear to be any lithic artifacts (e.g. pestles, mortars, lithics with the so-called "sickle sheen") from the Neolithic levels of the Vela spilja assemblage which would indicate extensive reliance on domesticated agricultural products. Plant remains are known from Neolithic archaeological contexts on the Dalmatian Coast (Hopf 1964; Karg and Müller 1988). Even in these cases, the remains from Danilo (Hopf 1964) are not entirely convincing for a completely domesticated crop, while the Pokrovnik remains (Karg and Müller 1988) tend to indicate some level of domestic production, although the extent is not clear. Pollen from wild varieties related to both emmer and einkorn are known from the pollen samples extracted from Malo Jezero on Mjlet, so it is easy to conclude that the these specimens were available on the landscape. Once again, the

[88] See Rice (1987: 19), for a general description of these wares.

[89] Both mortar and pestle are known from the Eneolithic/ Early Bronze Age finds from Vela spilja, but are currently unpublished by Čečuk. The mortar on display in the *Arheološki muzej* in Vela Luka is almost identical to the one discovered by the author on Maslinovik (see fig. XXX).

point being made is not whether plant products were being harvested, but rather which varieties (wild *versus* domestic) and to what extent.

As the massive faunal assemblage from the Neolithic levels of Vela spilja indicates, there was a heavy reliance on numerous local resources. When the excavated materials are examined in a detailed (albeit preliminary) manner, it is clear that there was a big reliance on molluscs[90], wild birds, some ovicaprids, wild (and domestic?) pig, and bluewater marine species such as tuna, dolphin, and swordfish. However, the evidence for both harvesting and preparing crop-based products is minimal at best. It is perhaps a false conclusion that polished stone should be coupled with domesticated agriculture. Polished stone is known from the Mesolithic levels at Odmut (Srejović 1974: 4) and can merely imply procurement and processing of wild varieties. Likewise, due to an almost complete absence of specific lithic tools such as, it is currently hard to put forward the notion that the Neolithic islanders on Korčula were reliant on either domesticated or wild wheats and grains. Therefore, until further research such as the floatation of excavated materials occurs, the idea of the Neolithic inhabitants having a well-rounded diet centered on domesticated plants and animals as the main staples simply does not hold up to current archaeological scrutiny.

It might very well be the case that the island inhabitants had more reliance on the sea than has been noticed in previous archaeological research. Indeed, fish bones do survive the archaeological record, although without either careful excavation or proper sieving techniques, these remains can go completely unnoticed and hence, unrecorded. The very few Neolithic sites coastal sites which have had some sort of quantified analysis on the faunal assemblage (e.g. Chapman et al. 1990) do not seem to take marine resources into specific account outside of the simple identification of estuarine and sea water mollusks, or to mention that these are merely "supplementary" resources. In effect, it could be that the rich source of marine resources is the main factor that sets apart the various economies of island, coastal, and inland Neolithic groups throughout the region.

The author's investigations at the geologic/ pedogenic site in the bay of u.v. Stiniva have shown that, not only is there evidence of further Holocene estuarine resources, but that some of these areas might have a larger role relating to other aspects of the culture, such as the procurement of clay for pottery. Another point to keep in mind is that the Stiniva geographic setting, like that noted at Malo Jezero on Mjlet, is now very different from the situation in the earlier Holocene. It is rather easy to conclude that many of these "hidden" resources had a rather important role in the

[90] Some of the molluscan remains, such as the *Charonia nodifera* (Triton's Trumpet), *Ostrea* (oysters), and *Spondylus* (abalone), are large enough to supply nutrients from only a few collected samples.

nearby prehistoric communities, yet generally go unnoticed in the archaeological record without specialized investigations.

12.2 Catchment Areas, Landscape, and Prehistoric Communities

In later times, such as the Bronze and Iron Ages, the question still prevails: What was happening in the lowlands? In some cases, such as the Donje blato on the east end of Korčula, the barren sodium-rich soils of the present day might have been totally different in those times. Likewise, the massive Blatsko polje, on Korčula's western end, was until fairly recent times known as a wetlands. In the case of the latter, a heavy morning fog often collects on the eastern limits of the field, perhaps a feature still related to the former estuarine environment.

The lowlands of the present day landscape probably have richer soils than past times. However, the current location of arable lands should not indicate the position of past arable lands. Likewise, grazing areas seem to be poorly accounted for in archaeological assessments of land use, except in a few cases (e.g. Zaninović 1977). Given the fact that many local Bronze and Iron Age faunal assemblages contain copious amount of medium-sized mammals such as sheep, goat, or pig, and larger mammals such as cattle, it seems strange that the areas where these animals would have been penned or grazed are often neglected. This must have occurred in some of the lowland areas that have been previously assigned solely as agricultural catchment areas.

Another problem that is apparent is the relationship between the Bronze and Iron Age sites, specifically the hilltop structures, and the surrounding landscape. In certain contexts highlighted through the use of GIS on the island of Hvar, it has been suggested that the hilltop structures might have a key role in the relationship between fertile lands and some sort of ritualized socio-cultural activities (Gaffney and Stančič 1991; Gaffney et al. 1995: 47-50). In the case of Korčula, there is not yet enough data to hypothesize as to whether these connections can be readily drawn. In any case, almost all descriptive aspects noted on Hvar, specifically the numerous high profile "landscape monuments" with an "undefended" nature and excellent viewsheds (op. cit.: 51) are confirmed on Korčula (Radić and Bass in press: a and b).

However, it is still not clear as to whether the lands of the polje which are currently designated as arable were either arable at all in past times or possibly used for purposes other than agriculture. The GIS research on Hvar indicated more agrarian focused cultures, as reflected by the association of the hilltop sites to soils (Gaffney et al. 1995), while juxtaposing the views of Zaninović, who supports a herding and grazing based culture (1977). Naturally, there is no reason to discount, in light of the

archaeological evidence, that the lowlands were used for both purposes and therefore, both of the models suggested would be valid to a certain point.

Wilkes (1969: 153-191) has covered the evidence for separate Illyrian groups that would have been around this part of the Dalmatian Coast in the Iron Age. While a review of this evidence is well out of the scope of this text, a few cultural aspects of these observations deserve mention. If Strabo's description is once again to be taken as a general reference:

> "...Then come the River Naro (Neretva) and the people who live about it-the Daorizi, the Ardiaei, and the Pleraei. An island called the Black Corcyra and also a city founded by the Cnidians are close to the Pleraei, while Pharos (formerly called Paros, for it was founded by the Parians) is close to the Ardiaei." (7.5.5)

then it would appear that there would have been distinct and separate cultural groups living in the area.

It is conceivable that landscape monuments were needed to demarcate the culturally recognized geographical limits or borders between the separate groups. However, there is no historical or archaeological evidence to clearly support the notion that intra-group identity required such demarcations. The Thiessen polygon projection offered by the author in this thesis supports this concept of a less confined social arrangement. In support of this view, Wilkes has also indicated the tendency for the natives of the Dalmatian Coast to be grouped in loose yet small communities (1969: 187), based on associations similar to tribes, and often with little political development (*op. cit.*: 190-191). Basically, if the Pleraei (or whatever groups came before) were situated on Korčula, there are no clear indications through the archaeological record which would convincingly support the notion for serious social divisions within the group. As noted, there is a general tendency for the sites to have an "undefended" nature. Hence, does this then imply that culturally, there were no reasons to "defend" from "within" the island community?

The many points brought up by Gaffney et al. (1995) concerning the positions of many undefended but high profile landscape monuments above currently arable soils cannot be overlooked. As the author's research suggests, this is also the scenario in many cases on Korčula. Likewise, it was noted in Chapter 10 that both the Thiessen polygons and the natural geographic delineations reveal very similar area and cultural catchments.

Certain sites on Korčula, such as KZ-006 or KS-007 do actually have well-preserved tower-shaped structures. In these cases, both sites are above small and somewhat geographically enclosed fields that currently hold semi-arable soils. Perhaps one function is that these high positions have been used to monitor grazing animals in the polje below. Since the lowland areas in question are somewhat contained, it would be

possible, with minimal effort, to reach the wandering herd or flock. The nature of an island would naturally dictate that the animals could not venture that far. In some prehistoric cultural areas which have been tentatively defined, such as Pupnat (fig. 89), it is conceivable that there would be a desire to keep animals within the general community area.

Likewise, the towers or high-profile sites can also be positions from which agricultural lands can be monitored (see plate 5). This need might arise from marauding animals, specifically sheep and goats, which can ruin crops. Alternatively, these high points on the landscape might be positions to monitor against marauding humans from outside the island's bounds[91]. This point is supported by Wilkes, who points out that the Ardiaei (from the island of Hvar and the adjacent coast) were the only natives known to have a social organization similar to a monarchy which oversaw organized piracy and naval warfare (1969: 190). Hence, there might be a need on Korčula to be prepared for the tendencies of nearby yet "outsider" cultural groups suggested by Dinko Radić (Radić and Bass in press: b).

In any case, the fact still remains that these sites and their undefended natures are intrinsically tied to the surrounding island landscape. If, as the author and those cited above believe, these geographic parameters are important to the social structuring of the prehistoric communities on the Central Dalmatian islands, then perhaps further data can be gathered from other geographic areas not well explored. It should be apparent that initial survey of the hilltops have been well initiated on the Central and Southern Dalmatian islands. However, except for the Tależ hillfort on the island of Vis (see Forenbaher et al. 1993), there has yet to be an excavated prehistoric hilltop structure on these islands. To further complicate the issue, some of the largest hilltop structures on Korčula lack significant occupational evidence. Others, such as the massive Kom (KS-014), have no occupational evidence at all. Therefore, without a proper study of these hilltop structures, the situation will remain quite hazy.

This would then point towards another unanswered question: Where were the prehistoric communities who were responsible for such massive stone relocation efforts situated? Except for perhaps the Pupnat example, which is still relatively unexamined (fig. 89), there are no convincing lowland areas which have been identified as "settlements" or "settlement sites". The preliminary data presented in this thesis would indicate that separate communities, nevertheless part of one social-cultural group, would be living throughout each of the catchment areas defined by the Thiessen

[91] However, this situation would appear highly unlikely, as raiding the processed crops is a much more viable endeavor.

polygons. However, the basic models discussed will have many weak aspects that will only be clarified when the lowlands are investigated more thoroughly.

12.3 General Conclusion

While many of the prehistoric aspects of the island, such as the social, political, and economic bases are still quite uncertain, many areas of this research have revealed new data, not only for Korčula, but the Central and Southern Dalmatian Coast. The author's brief field investigations into Jakasova spilja have revealed the presence of hitherto unknown Copper Age occupations. Furthermore, an Early Neolithic sherd overlooked in the Čečuk/ Radić collections from that cave site was detected. It was then tested through both XRF and XRD and shown that, preliminarily, this sherd bears remarkable similarities to the mineralogical and chemical compositions of known Early Neolithic sherds from the nearby Vela spilja. This could imply one mobile Neolithic community using similar source materials, or numerous communities using like materials. In any case, the preliminary data points towards clear cultural connections between the two cave sites, beyond the usual motif and fabric similarities between the pottery.

The author's investigations into the nature of sedimentation in various caves, including the previously undocumented Spilja u Isruškom dolcu, has injected vital precursory data into an area of research that has gone completely unexamined. Since so much of the past cultural evidence on the Dalmatian Coast is derived from these caves, it stands to reason that the components of both the natural and human deposits must be understood. Likewise, the author's use of aerial photos, historical documents, informant interviews, and foot survey, coupled with laboratory controlled sediment analysis, has introduced new evidence not only regarding the extent of the anthropogenic soils, but also the exact nature of specific pedogenic profiles, their depositional environments and what implications these factors carry. Furthermore, this thesis research revealed that even during the Roman occupations on Korčula, certain precautions had to be taken to control the level of soil transport away from the lowland *polje*.

Analysis of the Bronze and Iron Age landscape, specifically the hilltop structures, has confirmed that Korčula conforms to similar documented evidence from nearby islands. Furthermore, certain factors, such as the high levels of preservation of some hilltop sites or the clustering of many different site types into one small geographic area[92] tend to support not only certain site functions, but also their associations to nearby prehistoric communities. It is this latter point which is extremely vague yet well

discussed in archaeological literature focused on the region. Supported by test excavations, intensive survey with a larger team, and GIS, research will expand in the Pupnat area to extract more data on the prehistoric Bronze and Iron Age communities of the Dalmatian islands.

The database used in this research is generally consistent with that used by the Adriatic Islands Project. Therefore, is it within concept that the data from Korčula can eventually be linked to Hvar, Brač, Šolta, Vis, and Palagruža, through a GIS, to create an extremely unique and valuable database for both the Adriatic and the Mediterranean Basin. Clearly, there are many areas on Korčula which need much more examination. Most of the main pitfalls concerning research on the island have been overcome, but in the same light, many archaeological problems have been exposed which still lack a large dataset. Finally, the new avenues of research (e.g. sediment analysis, XRD-XRF), opened through this thesis research, will serve as the foundation for future investigations on Korčula, which will hopefully shed light on the archaeological record of the region.

[92] e.g. the Pupnat area, which has not only evidence of the old road system, but also numerous types of hilltop structures (simple and complex), quarries, fresh water sources, high-profile monumental limestone cairns, and burials.

References Cited in the Text and Database

Abbreviations Used in the References

AA	American Antiquity, Journal for the Society of American Archaeology, Washington, DC.
ABF	Acta Botanica Fennica, Helsinki.
AED	Acta et dissertationes archaeologicae, Arheološki radovi i rasprave, JAZU, Zagreb.
AIFK	Arheološki Institut Filosofskog Fakulteta, Zagreb.
AJ	Archaeologia Jugoslavia, Belgrade.
AJA	American Journal of Archaeology, Princeton.
AJPA	American Journal of Physical Anthropology.
AK	Archäologisches Korrespondenzblatt, Mainz.
Antiquity	Antiquity Publications-Oxford University Press, Oxford.
AP	Arheološki Pregled/ Archaeological Reports, Ljubljana.
Arc	Archaeometry, Oxford.
Arheo	Arheološka obvestila, Glasilo Slovenskega arheološkega društva, Ljubljana.
ArP	Arheološki Pregled, Belgrade.
AV	Arheološki Vestnik, Ljubljana.
BAR-IS	British Archaeological Reports: International Series, Oxford.
BD	Bullettino di Archaeologia e Storia Dalmata, Split.
Diadora	Diadora: Glasilo Arheološkog Muzeje u Zadru, Zadar.
GdZ	Gazzetta di Zara, Zadar.
GZSKHr	Godišnjak Zaštite Spomenika Kulture Hrvatske, Zagreb.
GZM	Glasnik Zemaljskog Muzeja u Sarajevu, Sarajevo.
Hesperia	Hesperia: Journal of the American School of Classical Studies at Athens.
IHAD	Izdanja Hrvatskoga arheološkog društva, Zagreb.
JAZU/L	Jugoslavenske Akademije Znanosti i Umjetnosti; Ljetopis, Zagreb.
JAZU/R	Rad Jugoslavenske Akademije Znanosti i Umjetnosti, Zagreb.
JFA	Journal of Field Archaeology, Boston.
JHS	Journal of Hellenic Studies, London.
JMA	Journal of Mediterranean Archaeology, Sheffield, England.
Materijali	Kongres Arheologa Jugoslavije, Hrvatsko Arheološko Društvo, Zadar.
OHAD	Obavijesti Hrvatskog arheološkog društva, Zagreb.
PPUD	Prilozi povijesti umjetnosti u Dalmaciji, Split.
PPS	Proceedings of the Prehistoric Society, Cambridge.
PJZ	Praistorija yugoslavenskih zemalja, Centar za Balkanološka Ispitivanja, Academija Nauka i Umjetnosti B i H; Sarajevo.
RFFZ	Radovi Filozofskog faculteta u Zadru, Zadar.
ROB	Rijksdienst voor het Oudheidkundig Bodemonderzoek, Institute for Pre- and Protohistory, University of Amsterdam (IPP).
RSP	Revista di Scienze Preistoriche, Firenze.
SAR	Scottish Archaeological Review, Glasgow.
Starinar	Starinar: Organ arheološkog instituta Serb. Akadem. Nauk.; New Series (1950-), Belgrade.
VAHD	Vjesnik za arheologiju i historiju dalmatinsku, Split.
VHAD	Vjesnik Hrvatskog arheološkog društva, Zagreb.
WPZ	Wiener prähistorische Zeitschrift, Wien (Vienna).

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